RESEARCH BULLETIN 1125 FEBRUARY 1981

An Annotated Bibliography of Weeds as Reservoirs for Organisms Affecting Crops

IIa. Arthropods

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AN ANNOTATED BIBLIOGRAPHY OF WEEDS AS RESERVOIRS FOR ORGANISMS AFFECTING CROPS

IIa. Arthropods

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Introduction

Weeds reach into every dimension of the ecosystem. They strike at the health of man both directly and indirectly. They impact on the health of wild as well as domesticated animals. They interfere with all types of transportation--air, ground, and water. They restrict land and water utilization. And, in addition to the many other areas of impact, they strike a heavy blow in delimiting food and feed production. Not to be forgotten is the aesthetic aspect.

Weeds delimit production of food and feed crops by direct competition for abiotic factors required for growth--light, water, and mineral nutrients. The outcome of this competition is a function of the crop, the weeds, and the level of sophistication and timeliness of the farming operation. Extreme cases result in total crop failure. Regardless of the outcome, however, weeds are costly.

Weeds also delimit crop production indirectly by serving as reservoirs for organisms adversely affecting crops. Weeds serve as reservoirs by providing feed, shelter, and a reproductive site to maintain a population of an organism. These organisms include arthropods, nematodes, pathogens, and vertebrates. Many of these organisms themselves are devastating to crops, with the potential of reducing crop yield to zero. Their effects on crops are often more visible and alarming than is competition by weeds, even though their consequent effects on crop production may not be greater. Furthermore, given weed species may serve as a reservoir for more than one species adversely affecting crops, thus further compounding the problem.

The importance of weed control in crop production increases in an additive manner when the indirect aspects of weeds as reservoirs for organisms affecting crops, as well as the direct effects, are considered. The economics of preventing an outbreak of a disease or an insect by controlling a weed population, while at the same time eliminating competition by the weed with the crop, are very appealing. Control of the other species comes as a bonus to the reduction of competition by the weeds.

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Johnsongrass *(Sorghum halepense* L.) may serve as an example to illustrate the direct and the indirect effects of a weed on a crop. Established populations of johnsongrass can offer such severe competition to maize *(Zea mays* L.) plantings that crop failure is complete. Control is difficult and costly. In Ohio, johnsongrass is the overwintering host of maize dwarf mosaic virus (MDMV) and of maize chlorotic dwarf virus (MCDV). It also hosts the several species of aphids which vector MDMV and the leafhopper vector *(Graminella nigrifrons)* of MCDV. Early season infection of maize by these viruses can reduce crop yield to zero. Johnsongrass also hosts a lesion nematode *(Pratylenchus* sp.) which parasitizes maize, causing economic losses in production.

This example of johnsongrass illustrates the multidisciplinary nature of weeds as reservoirs for organisms affecting crops, in addition to illustrating the direct and indirect effects of a weed on crop production. This one weed species, johnsongrass, hosts arthropods, nematodes, and pathogens which affect crop yields. Consider the multiple, far-reaching effects of controlling this one weed species--effects relating to crop yield and to the economics of crop production. In addition to these crop production aspects, effective johnsongrass control would affect programs of breeding for resistant crop varieties and programs on research aspects of the organisms hosted by johnsongrass. The importance of johnsongrass control is unquestionable, especially for those who have to contend with it. Perception of this multidisciplinary problem requires an integration of information.

The trend in research and teaching has been in the direction of increased specialization. This specialization has departmentalized the aspects of crop production, leaving a void regarding generalization or integration which gives relevance to the specialized information. Perception of the role of weeds as reservoirs for organisms affecting crops has been neglected in research and teaching during this age of specialization, but in the field the web of relationships among organisms has continued, unaffected by administrative departmentalization and academic classification.

The objectives of this research were: 1) to find and bring together the literature relating to this neglected aspect of crop protection and crop production; 2) to illustrate and emphasize the role of weeds as reservoirs for organisms affecting crops and crop production; 3) to emphasize the multidisciplinary nature of crop protection in crop production; 4) to afford a readily available source of ideas for research in this neglected aspect of crop protection; 5) to emphasize the key role of weeds and their control in crop production; and 6) to illustrate the important indirect effect of weeds in delimiting crop production.

Literature searches have been undertaken of weeds reported to be serving as reservoirs for organisms affecting crops. The results of these searches are being published as separate annotated bibliographies relating to specific groups of organisms--arthropods, nematodes, pathogens, etc. The original intent was to include those research reports which identified specific weeds as hosts for specific organisms of economic significance in the production of specific crops.

Literature searches may have missed reports which should have been included. If so, the authors request that these omitted references be brought to their attention.

It is hoped that this work will serve as a fruitful resource for subjects of multidisciplinary research to increase crop production and that it will stimulate further research into the role of weeds as reservoirs for organisms affecting crops.

The multidisciplinary nature of this work may have increased significance also in view of current concerns regarding vegetation management and monoculture vis-a-vis multiple cropping systems of farming. These matters are of current interest because of the perceived urgency to increase food production and because of environmental concerns. Further consideration of the interrelationships of organisms--crop, weed, pathogen, nematode, arthropod--may expectantly bring increased relevance to the decision making process.

The bulk of the literature in this section on arthropods affecting crops was found as research reports cited in the Review of Applied Entomology, Volumes 58 (1970) through 66 (1978). Volumes 1 (1913) through 57 (1969) have been searched and that literature will be compiled in a subsequent publication as soon as it can be prepared. Original sources of all available reports were reviewed. The research reports of special interest were those which identified a specific weed species as the host of a specific species of arthropod which attacked a specific crop species.

Sixty families of plants were represented by the weeds reportedly serving as hosts of arthropods affecting crops. Weed species classified among the gramineae family were reported far more often than any other; next was compositae; then leguminosae, solanaceae, malvaceae, chenopodiaceae, cruciferae, amaranthaceae, cyperaceae, and polygonaceae.

More than 70 families of arthropods affecting crops were reported as being hosted by weeds. Those reported most frequently were aphididae, noctuidae, curculionidae, and chrysomelidae; less frequently were pentatomidae, thripidae, cicadellidae, and tetranychidae.

It might be concluded from the results of this literature search that much more definitive research is needed on weeds as reservoirs for arthropods affecting crops--perhaps a positive effect as well as a negative effect. It is hoped that this literature compilation will stimulate interest and be of assistance in directing research activities along that vein.

The entries are listed alphabetically by author. The format of the entry is: author, year, title, and source, followed by specific data. The index includes an alphabetical listing of authors and organisms, with notations referring to all relevant entries.

Bibliography

001 Abul-Nasr, S., I. El-Sherif, and M. A. Naguib. 1972. Oviposition behavior of the cotton leaf worm *Spodoptera littoralis* (Boisd.) in clover fields (Lepidoptera: Agrotidae). Zeitschrift fuer Angewandte Entomologie, 70(3):310-314.

In early autumn in the north Delta region of Egypt, females of *Spodoptera littoralis* (Boisd.) were observed in clover fields to lay eggs on any erect object 20-200 cm high, tree trunks as well as weeds, and on damp soil near seedlings. Few egg masses were found during winter, but from early April to late June they were common on clover and weeds. For control of the moth, spraying of weeds and tree trunks at the periphery of fields and of the fields themselves in a narrow belt on their northern and western borders in early autumn is thought likely to be of benefit.

Recorded weeds that carried the egg masses were: *Eragrostis bipinnata, Xanthium strumarium, Convolvulus arvensis, Cyperus difformis, Cichorium* sp., *Sinapis alba, Melilotus indica, Chenopodium murale, Plantago major, Rumex dentatus, Medicago hispida, Lepidium sativum, Sisymbrium irio,* and *Corchorus olitorius* var. *incisifolius*. The cotton leaf worm *Spodoptera littoralis* is a pest of major economic importance in Egypt. Between mid-September and late October, *S. littoralis* laid some egg masses on vegetables and maize plants that covered limited areas.

002 Abushama, F. T. and E. T. M. Elkhider. 1976. Food preference of the acridid grasshopper *Truxalis grandis grandis* (Klug). Acrida, 5(3):245-255.

Food selection by *Truxalis grandis grandis* Klug, which is suspected of being a potential pest of vegetables in the Khartoum district of the Sudan, was studied in the laboratory. The grasshopper showed marked preference for the common grasses, *Cynodon dactylon* and *Cyperus rotundus*. *Euphorbia heterophylla* and *Carotropis procera* were always rejected.

003 Alimdzhanov, R. A. 1971. Factors affecting mass outbreaks of polyphagous Noctuidae on leguminous and cereal crops. Institute Zashchity Rostenir, 32(1): 48-53.

Factors associated with massive outbreaks of polyphagous species of Noctuidae, notably *Heliothis armigera* (Hb.), (*Chloridea obsoleta* Auct.), *Spodoptera (Laphygma) exigua* (Hb.), and *Autographa (Phytometra) circumflexa* (L.), on beans and cereals in Uzbekistan are discussed with reference to environmental conditions and weed food plants.

004 Altay, M., B. Erkam, and A. Gurses. 1972. Investigations on the distribution, bionomics and control of the pests *Sitona crinitus* Herbst., *Phyllobius argentatus* L., *Phyllobius canus* L., and *Polydrusus impressifrons* Gyll. causing economic damage to peach in the Marmara region. Bitki Koruma Bulteni, 12(1):49-76.

Sitona crinitus (Hbst.), *P. impressifrons* Gylh., *P. canus* Gylh., and *P. argentatus* (L.) cause serious damage to peach in the Marmara and Thrace regions of Turkey. They have not been previously recorded attacking this food plant. The larvae develop in the soil and feed on the roots of weeds.

005 Ananthakrishnan, T. N. and C. Kandasamy. 1977. On the trends of infestation of two species of *Baliothrips uzel* on paddy, maize and their weed hosts. Cur-

rent Science, 46(10):344-345. Entomology Research Unit, Loyola College, Madras 600 034, Tamil Nadu, India.

The trends of infestation of young rice and the wild alternative food plants *Echinochloa colonum* and *Cyperus iria* by *Baliothrips biformis* (Bagn.), and of young maize and the wild alternative food plants *E. colonum* and *Borreria hispida* by *Baliothrips holorphnus* (Karny), were investigated in Tamil Nadu in 1976. Owing to the high rate of multiplication and short development period of *B. biformis* in particular, outbreaks and serious damage on rice can occur in a short space of time; the degree of population build-up on weeds before rice transplanting, and the extent to which the risk of damage to the young crop can be reduced by removal of these weeds, are therefore very important. In the nursery, infestation of rice began 8-10 days after germination, with a build-up of adult populations until the 20th day followed by a decline until transplanting 25-28 days after germination; more males than females were observed. Populations were generally low on the weeds present with the rice, but the decline of the pest population on rice corresponded to a population increase on the weeds. On maize, distinct correlations were observed in April-June 1976 between the incidence of *B. holorphnus* on maize and weeds, although population build-up began later and progressed more slowly on maize than on weeds; steady patterns of increase and decrease, with single peaks, are shown in a table for all three food plants, with the peak on *E. colonum* occurring 4 weeks after that on *Borreria* and a much smaller peak on maize occurring 1 week later.

006 Ananthakrishnan, T. N. and K. Thangavelu. 1976. The cereals thrips *Haplothrips ganglbaueri* Schmutz. With particular reference to the trends of infestation on *Oryza sativa* and the weed *Echinochloa crus-galli*. Proc., Indian Academy of Science, B 83(5):196-201.

The trends of infestation of *H. ganglbaueri* on *O. sativa* (rice) and the weed *E. crus-galli* in paddy fields are discussed, along with its biological and taxonomic aspects.

007 Ananthakrishnan, T. N. and G. Thirumalai. 1977. The grass seed infesting thrips *Chirothrips mexicanus* Crawford on *Pennisetum typhoides* and its principal alternate host, *Chloris barbata*. Current Science, 46(6):193-194. Entomology Research Unit, Loyola College, Madras 600 034, Tamil Nadu, India.

Chirothrips maximi Ananthakrishnan, *Chirothrips ramakrishnai* Ananthakrishnan, *Chirothrips mexicanus* D. L. Crawford, and *Chirothrips meridionalis* Bagn. are the major species of Thysanoptera infesting grasses in India, and it is known that populations build up on different crops at different stages of their growth. Overall seed damage in *Pennisetum* was about 5-10% but in *Chloris* it appeared to be about 60%. In view of the ability of *Chirothrips mexicanus* to maintain steady populations in the wild grass, the possibility of a heavy build-up in *Pennisetum* ears cannot be overlooked.

008 Anderson, K. 1968. *Haplodiplosis marginata* in 1967. Vaxtskyddsnotiser. 32(1):8-12.

Damage by *H. marginata* (Roser) (*equestris* (Wagn.)) has occurred over an increasingly wide area of Skane, in southern Sweden, since 1960, causing damage especially to barley and wheat but occasionally to oats. Eggs of *H. marginata* are laid mainly on upper surfaces of the leaves of cereals and wild grasses.

009 Angeles, N. deJ., R. G. Oakley, and J. A. Osorio. 1969. Control of aphids on potato and *Capsicum*. Notic. Agri. Serv. Shell Agri., 5(14):55-56.

In Venezuela, potato is damaged by *Myzus persicae* (Sulz.), *Macrosiphum euphorbiae* (Thos.), and *Rhopalosiphum rufiabdominales* (Sasaki). *M. persicae* also damages *Capsicum*. Clean cultivation and the destruction of weeds, particularly grasses in the vicinity of crops, are important for control.

010 Angelova, P. 1978. Efficient control of Acarina on fruit plantings. Rastitelna Zashchita, 26(4):5-7 (Bg).

The fruit-tree red mite, *Panonychus ulmi* (Koch), is a perennial pest of apple in parts of Bulgaria. Unremoved weeds have provided further sources of infestation. Much control is afforded by natural enemies, and efforts must be made to spare these when sprays are planned.

011 Anonymous. 1978. A thrips (*Frankliniella brevicaulis* Hood)--Puerto Rico--new United States record. U. S. Dept. of Agriculture, Cooperative Plant Pest Report, 3(11):87.

Frankliniella brevicaulis Hood, which is known in Panama, Trinidad and Tobago, Venezuela, Brazil, and Cuba, infesting maize, banana, *Clerodendron*, and wild *Fabaceae*, was recorded for the first time from Puerto Rico in November 1977 when it was found on maize at Toa Alta. This is the first record of this species in the USA.

012 Anonymous. 1969. Cocoa Research Institute Annual Report. Ghana Academy of Sciences. 126 pp.

Work on pests and diseases of cocoa in Ghana in 1967-68 was reviewed. Cicadellids referred to as *Empoasca* spp. (but subsequently described by Ghauri as *Afroccidens lodosi* and *Afroccidens sympatrica*) oviposited on the leaves of *Millettia thonningii*, an alternative food plant common in cacao plantations.

013 Anonymous. 1976. Gout fly. Advisory Leaflet No. 174, 4, Ministry of Agriculture, Fisheries and Food, United Kingdom.

In this revised leaflet, notes are given on the appearance, life history, natural enemies, and preventive cultural control of *Chlorops pumilionis* (Bjerk.), and on the damage that it causes to barley, wheat, and rye in Britain. Control measures relate to the timing of sowing, to manuring, and to clean cultivation (in particular the removal of wild grasses, which are alternative food plants for this pest).

014 Anonymous. 1969. International Rice Research Institute Annual Report. Los Banos, Laguna, Phillipines. 226 pp.

In investigations on grassy stunt disease and its vector *Nilaparvata lugens* (Stal), various weeds were found to serve as temporary food and even breeding plants for the insect, but did not become diseased. After confinement on some of them, *N. lugens* was still able to transmit grassy stunt to rice. In other cases the planthopper lost its infectivity.

015 Anonymous. 1969. *Opomyza* -- a pest of winter cereals. Zashchita Prstenit, 14(11):24-25.

Opomyza florum (F.) damaged winter wheat in recent years in the Stavropol area of the Soviet Union as well as in other regions. The adults appeared at the end of May. In the central and sub-mountain zones, they passed the summer in forest clearings and forest belts among wild grasses. In the mountain zones, they occurred on leguminous plants and grasses. At the end of September, the flies migrated to winter wheat. *O. florum* also infested winter cereals, notably wheat and barley, in the Kabardino-Balkaria area.

016 Anonymous. 1970. Outbreaks and new records. Plant. Prot. Bull., FAO, 18(5): 114-120.

Recent serious outbreaks of *Zulia entreriana* (Berg) in pastures in the southern part of the state of Bahia have severely curtailed milk production but that damage was localized and regrowth occurred normally. The Cercopids that attack wild and cultivated grasses in the region extending from the north of Bahia to the state of Rio Grande do Norte are listed.

017 Anonymous. 1972. Rice pests, diseases and weeds in Southeast Asia and Pacific Region. Technical Document, Plant Protection, Committee for Southeast Asia and Pacific Region, FAO, No. 21, 21 pp.

018 Anonymous. 1977. Studies on the biology and control of cutworms in Peking suburbs. Acta Entomologica Sinica, 20(3):294-302. Division of Plant Protection, Academy of Agriculture, Peking Municipality, China.

Cutworms are important pests of spring-sown crops in the Peking area of China, the main species being *Agrotis ipsilon* (Hfn.), *Agrotis segetum* (Schiff.) (*Euxoa segetum*) and, to a lesser extent, *Protexarnis squalida* (Gn.) (*Agrotis squalida*), *Trachea tokionis* (Btlr.), (*Agrotis tokionis*), and *Euxoa oberthueri* (Leech). *A. ipsilon* preferred to oviposit on young plants of *Chenopodium album* and *Polygonum lapathifolium* and on dried exposed roots, while *A. segetum* preferred sesame seedlings before the appearance of the first pair of true leaves. Integrated control measures against cutworms included the introduction of a rational cropping system, enlargement of the areas of autumn-sown crops, increase in the indices of multiple cropping, and the exercise of tillage, weed control, and irrigation.

019 Anonymous. 1976. Studies on the rice thrips (*Thrips oryzae* Williams) in the Tungtai area, Kiangsu Province. Acta Entomologica Sinica, 19(1):39-50.

Baliothrips biformis (Bagn.) (*Thrips oryzae* Williams) has become a more important pest of rice in the Tungtai area of Kiangsu Province since the development of the double-crop system of rice cultivation and the extension planting of early maturing varieties in China. There are about 10 generations of thrips each year. Females oviposited on *Leersia japonica* and other grasses. Adults of the overwintering generation emerged in mid-April. During the first half of May, adults of the second generation moved to paddy fields, causing some leaf damage. Maximum damage was caused by the second and fourth generations during mid-May to mid-July, with the largest population occurring in mid-June.

020 Anonymous. 1967. The biological characteristics of some species of the family Tenuipalpidae in Turkey. Proc., 2nd Int. Cong. of Acarology, pp. 169-171.

Two species of Tenuipalpidae, *Cenopalpus pulcher* (C & F) and *Cenopalpus bakeri* Duzgunes, were found and studied in Central Anatolia. *C. pulcher* infested apple and quince mainly, but also *Crataegus* spp., stone fruits, loquat (*Eriobo-*

tyra japonica), and walnut. It was very widespread. *Cenopalpus bakeri* has been found only on *Crataegus* spp. in Ankara, and attempts to rear it on various fruit trees failed.

021 Arthofer, R. 1976. Spider-mites in vine cultivation. Pflanzenarzt, 29(67):73.

Vineyards in the Austrian Burgenland, especially those near the Neusiedler Sea, are usually infested by *Panonychus ulmi* (Koch) and *Tetranychus urticae* Koch, but the two species are not found on the same food plant. In one plot, *P. ulmi* attacked the vines and *T. urticae* infested the weeds growing beneath them. In another plot where *T. urticae* had overrun vines, brambles, and weeds, *P. ulmi* confined itself to a nearby pear tree.

022 Bailey, C. G. 1976. Feeding habits and food preferences of *Melanoplus bivittatus* and *Melanoplus femurrubrum* (Orthoptera: Acrididae). Canadian Entomologist, 108(11):1207-1212.

The feeding habits of *M. bivittatus* (Say) and *M. femurrubrum* (Deg.) in grassland in Ontario were studied in 1971 and 1972 by analyzing the crop contents. Both species preferred nongraminaceous plants to grasses. *M. bivittatus* showed preferences for *Cichorium* sp. and, to a less extent, *Trifolium pratense* and *Taraxacum officinale;* and *M. femurrubrum* for *Lotus corniculatus, Phleum pratense,* and *Taraxacum officinale.* Both species ingested a wide range of food plants in the field.

023 Balevski, A. and Kh. Kontev. 1969. *Penthaleus major* (Duges)--a new species of mite on wheat in Bulgaria. Rastitelna Zashchita, 19-21.

In the spring of 1966, a wheat crop in the Tolbukhin district of Bulgaria was found to be heavily infested by *P. major*, which constituted the first record of this mite for Bulgaria. Its main food plant was *Poa bulbosa,* from which it migrated to the wheat.

024 Banham, F. L. 1971. Native hosts of western cherry fruit fly (Diptera: Tephritidae) in the Okanagan Valley of British Columbia. J. of the Entomol. Society of British Columbia, 68:29-32.

Prunus emarginata and to a lesser extent *Prunus virginiana* were found to be important for the existence of isolated, low, endemic populations of *Rhagoletis cingulata indifferens* Curr. (*R. indifferens*). Widespsread infestations of *R. cingulata indifferens* were found on cultivated sweet and semi-sweet cherries.

025 Baran, M. 1970. The cabbage aphid (*Brevicoryne brassicae* L.). Biologieke Proce Slovenskej Akademie, Vied., 16(4):92 pp.

Various stages of *B. brassicae* (L.) and recorded observations on its bionomics in Slovekia in 1964-66 were described. It overwinters in the egg stage on wild and cultivated crucifers.

026 Barbulescu, A. 1972, publ. 1974. Studies on the biology and attack of the noctuid *Cirphis unipuncta* Haw. in the conditions of Rasht, Iran. Analele Institutului de Cercetari pentru Protectia Plantelor., 10:325-331.

In Iran, *Mythimna* (*Cirphis*) *unipuncta* (Haw.) attacks various cereals including rice. It had three to four generations a year and overwintered mainly in the larval stage; the first adults emerged in May. The heaviest infestations

occurred in maize, sorghum, clover, and mixed crops of birdsfoot trefoil (*Lotus corniculatus*) and timothy grass (*Phleum pratense*). The rate of infestation of maize was in proportion to the numbers of weeds in the field, being especially severe in the maize field overrun with *Echinochloa crus-galli*.

027 Bardner, R. and W. M. Mathenge. 1974. First record of *Phytometra orichalcea* (F.) (Lepidoptera: Noctuidae) feeding on coffee foliage. East African Agri. and For. J., 40(2):214.

Diachrysia (*Phytometra*) *orichalcea* (F.), attacking a wide range of crops, was observed for the first time on coffee in June 1974. The Noctuid is thought to have spread to coffee from one of its wild food plants, *Bidens pilosa*, a common weed in Kenya coffee plantations.

028 Barnes, M. M. 1970. Genesis of a pest: *Nysius raphanus* and *Sisymbrium irio* in vineyards. J. Econ. Entomol., 63(5):1462-1463.

Nysius raphanus How. has been a sporadic pest of grapes grown for wine in southern California for at least 35 years. Observations over several seasons showed that the adults apparently overwintered and gathered in late February and March, when the vines were still dormant, in considerable numbers on developing stands of *Sisymbrium irio*, a cruciferous weed on which they feed.

029 Barnett, W. W., G. W. Morehead, C. S. Davis, J. L. Joos, B. E. Bearden, and A. Berlowitz. 1976. True bugs cause severe pear damage. Cal. Agr., 30(10):20-23.

Euschistus conspersus Uhl. and *Leptocoris rubrolineatus* Barber cause severe damage to pear fruits. *Euschistus conspersus* overwinters in the adult stage on weeds and in protected places near orchards. It afterwards feeds and oviposits on *Rumex* spp. and *Brassica* spp. or cover crops in the orchard. Barley also serves as a host.

030 Batra, H. N. 1969. Food plants, bionomics, and control of flea beetles. Indian Farming, 19(3):38-40.

The species of flea beetles that damaged cultivated plants in India, especially vegetables and cereals, were enumerated, and notes were given on the bionomics, food plants, and control of the four most important, *i.e.*, *Psylliodes brettinghami* Baly, *Phyllotreta cruciferae* (Goeze), and *Luperodes* sp., which were observed by the author at Delhi, and *Chaetocnema basalis* Baly, as reported from Rajasthan. The occurrence of *P. cruciferae* on *Gynandropsis pentaphylla* and of *Luperodes* sp. on *Heliotropium indicum* has led to the suggestion that these weeds might be used as trap-crops near susceptible economic plants. Food plants damaged by *P. cruciferae* are cowpea, cucurbits, cabbage, cauliflower, rape-mustard, radish, turnip, spinach, and brinjal. *Luperodes* sp. attacks cowpea, cucurbits, *Phaseolus mungo radiatus*, sannhemp, moong, spinach, and occasionally cruciferous crops. *Chaetocnema basalis* feeds on wheat, knol kohl, *Convolvulus arvensis*, carrot, napiergrass, turnip, radish, and winter maize.

031 Beingolea, G. O. D. 1969. Contribution to the knowledge of the Ortheziids of Parv. II. Bionomics: development and reproduction. Ministerio de Agricultura, Lima, Peru, 33-40.

The species dealt with are the olive form of *Orthezia olivicola* Beingolea, reared mainly on *Ambrosia artemisioides*, and the citrus form of this species

reared on potato sprouts and *Solanum nigrum; Orthezia pseudinsignis peruviana* Beingolea, reared on *Lantana* sp.; *Orthezia paragraminis* Beingolea, reared on *Panicum barbinode;* and *Orthezia nigrispinis* Beingolea, reared on *A. artemisioides.*

032 Ben Saad, A. A. and G. W. Bishop. 1969. Egg laying by the alfalfa weevil in weeds. J. Econ. Entomol., 62(5):1226-1227.

In investigations in northern Idaho, nine species of weeds (*Poa bulbosa, Stellaria media, Thlaspi arvense, Lepidium campestre, Descurainia incisum, Lamium amplexicaule, Matricaria matricarioides, Capsella bursa-pastoris,* and *Holosteum umbellatum*) out of 17 collected from lucerne fields were found to be susceptible to oviposition by *Hypera variabilis* (Hbst.) *(postica* (Gylh.)). Oviposition on weeds was observed throughout the spring and early summer of 1968. *L. amplexicaule* and *C. bursa-pastoris* were more acceptable than lucerne; in some samples, 100% of the stems contained eggs. As the larvae that hatched in the stems of weeds did not feed, it is thought that migration to nearby lucerne must occur. Further observations indicated that *L. amplexicaule* was susceptible to oviposition only in the vicinity of lucerne.

033 Berbagallo, S. 1970. Contribution to knowledge of *Calocoris (Closterotomus) trivialis* (Costa) (Rhynchota-Heteroptera, Miridae). Morphology of the adult and biology. Contributo alla conoscerza del Calocoris (Closterotomus) trivialis (Costa) (Rhynchota-Heteroptera, Miridae). Morfologia dell' adulto e biologia. Entomologiea, 6:1-101.

Calocoris trivialis (Costa) is a pest of various plants in the Mediterranean region, especially olive and citrus species. From field and laboratory observations in 1964-65 and 1968-69 in eastern Sicily, it was found that the Mirid overwintered in the egg stage in soft weathered wood, old pruning scars being a favorite oviposition site. The young nymphs either remained on the citrus trees and punctured the young shoots or migrated to herbaceous plants, especially nettle (*Urtica*). The adults emerged after about 2 months and either fed on nettle or returned to citrus.

034 Berim, N. G. and L. E. Tatarintseva. 1976. Control of the potato noctuid on hops. 1976. Zashchita Rastenil., No. 6, p. 22.

Hops in the Leningrad district of the USSR are damaged by larvae of *Hydraecia micacea* (Esp.) (potato noctuid), which immediately after hatching feed on various wild grasses and move to hops after some 4 to 12 days. The period of migration lasts 20 to 25 days in all. The larvae bore into stems and cause withering by their feeding, after which they migrate to another plant. Recommendations for control include weed removal, inspection of hop gardens, spraying with organophosphates as soon as there are one to two larvae per plant, and various cultural measures designed to maintain the plants.

035 Bhat, P. K. and H. V. Shamanna. 1972. Some new collateral hosts of *Planococcus lilacinus* from south India. J. of Coffee Research, 2(2):27.

In the course of a survey for alternative food plants of *P. lilacinus* (Ckll.) in and around coffee estates in the Sakleshpur district of Karnatka, India, where the mealy-bug is a pest of coffee, it was found on *Amaranthus gracilis, Ludwigia lyssopifolia, Solanum nigrum, Mirabilis jalapa, Sonchus arvensis,* and *Spilanthes acmella.*

036 Bibolini, C. 1970. Appearance and injuriousness of *Mythimna unipuncta* Hw. (Lep. Noctuidae) in Versilia and references to its world importance in plant pathology. Frustula Entomologica, 10(4):38 pp.

In 1968, a sudden and unexpected outbreak of *M. unipuncta* (Haw.) occurred on maize and oats near Viareggio in the Tuscan Province of Lucca in Italy, as a result of which the plants were defoliated or destroyed. Information is given on the world distribution, food plants (mainly cereals, wild grasses, and reeds), economic importance and biology of this armyworm. The data from Italy were compared with those from other countries where the Noctuid is known as a constant severe pest. It was noted that in some places heavy infestation of grasses in ditches bordering crop fields and of lakeside reeds (*Phragmites communis*) as well as of cereals occurred in 1968, that only wild plants were attacked in 1969, but that further outbreaks on cereals occurred in September and October 1970. From this, from the lateness in the season of the crop infestations in 1968 and 1970 in Tuscany, and from the indications in the literature that wild food plants are preferred, it is concluded that *M. unipuncta* must have developed unnoticed for some time on wild plants near crop fields, and that, after a population peak in the third generation, the larvae migrated to the cereals. On lands bearing mixed crops or mixed weeds, only graminaceous plants were damaged.

037 Bogarada, A. P. and N. I. Ostrovskii. 1967. Some features of the bionomics of the poppy root weevil (*Stenocarus fuliginosus* Marsh.) under the conditions of the Ukraine. Zool. Zh., 46(8):1219-1223.

Studies were made over 4 years in three regions of the Ukraine on the bionomics of *S. fuliginosus* (Marsham), which had seriously reduced the yield of cultivated poppy in recent years. The weevil had one generation a year and overwintered as adults under plant remains in woods, by roads, in field borders, and on wasteland and sometimes in the soil of poppy fields. When the overwintered adults resumed activity they were found on various weeds, but migrated to poppy fields for feeding and oviposition. Among wild plants, eggs were laid only on *Papaver rhoeas*, which was 30-40% infested.

038 Bongers, J. 1969. The problem of the food preference of *Oncopeltus fasciatus*. Zur Frage der Wirtsspezifitat bei *Oncopeltus fasciatus* (Heteroptera: Lygaeidae). Entomologia exp. app., 12(2):147-156.

The food preference of *Oncopeltus fasciatus* (Dall.) given seeds of *Asclepias syriaca*, *Helianthus annuus*, and *Arachis hypogaea* (groundnuts) was investigated in the laboratory in Germany. The insect clearly preferred seeds of *A. syriaca*, although the other seeds were accepted.

039 Bongers, W. 1970. Aspects of host plant relationship of the Colorado beetle. Meded. Landb. Hogesch., Wageningen, 70(10):77 pp.

Studies on the food plant preferences of *Leptinotarsa decemlineata* (Say) were reviewed from the literature and a detailed account was given of studies in the laboratory in Holland with leaves of various species of *Solanum* and of tomato. The suitability of the various species for development appeared to coincide with the food preferences. Potato was the best food plant for development and was preferred to bittersweet (*Solanum dulcamara*), which was the next best. *Solanum carolinense* and *Solanum rostratum*, which is thought to have been the original food plant of *L. decemlineata*, were satisfactory for development, but tomato, which was eaten by the beetles only when no other plant was available,

was not. *Solanum luteum* and *Solanum nigrum* were not eaten, even when no other food was available.

040 Bouchery, Y. and C. Putz. 1972. A raspberry mite hitherto little known in France. On acarien du franbiisier endore mal comuen France. Phytoma, 23(234): 18-19.

Although *Phyllocoptes (Eriophyes) gracilis* (Nal.) had been recorded from other European countries, its occurrence as a pest of raspberries in France had been overlooked, apparently because the damage it did was similar to that caused by the raspberry ring spot virus. However, the authors observed it on both wild and cultivated raspberry in numerous localities in France.

041 Bouchet, F. E. and J. P. Dagneaud. 1969. A note on the control of wheat blossom midges in France. Phytiathria-Phytophermacia, 18(3):135-145.

Information was given on the life history, flight times, varietal preferences, and control of *Sitociplosis mosellana* (Geh) and *Contarinia tritici* (Kby.) on wheat in northern France, based on observations and tests in 1966-68 following heavy infestations in 1966. Both species had one generation a year on wheat, but *C. tritici* also had a second generation in the summer on *Agropyron repens*.

042 Bournier, A. 1970. Damage to nectarines by thrips. Degats de thrips sur nectarines. Phytoma, 22(221):26-29.

During observations in Montpellier, France, injuries to nectarines were traced to *Taeniothrips vulgatissimos* (Hal.) (*meridionalis* (Priesn.)). Adults were found in almond flowers as soon as the flowers appeared. They migrated to other cultivated and wild species of *Rosaceae* for oviposition when the almond flowers fell.

043 Bournier, J. P. 1968. A new thrips injurious to cotton in Madagascar: *Caliothrips helini* Hood. Un nouveau thrips nuisible au contonnier a Madagascar: *Caliothrips helini* Hood. Coton et Fibres Tripicales, 23(3):403-412.

A thrips found on cotton in southwestern Madagascar was identified as *Caliothrips helini* (Hood). It was also found on *Commicarpus commersonii*, on which it reproduced more abundantly than on cotton. The destruction of plants of this species in the vicinity of cotton fields should reduce the incidence of attack.

044 Branson, T. F. and E. E. Ortman. 1967. Host range of larvae of the northern corn rootworm (Coleoptera: Chrysomelidae). J. Kans. Entomol. Soc., 40(3):412-414.

Field tests in South Dakota showed that *Diabrotica longicornis* (Say) completed its immature stages on *Setaria viridis*, *Setaria lutescens*, the Minter variety of wheat, the Omugi variety of barley, Oahe intermediate wheatgrass (*Agropyron intermedium*), and maize. Viable eggs were laid by females reared as larvae on *S. lutescens*, Minter wheat, and maize.

045 Brovdii, V. M. 1968. The Cassididae. Zashch. Rast., 13(1):31-32.

The Cassididae of the Palaearctic region feed on plants belonging to the Compositae, Labiatae, Chenopodiaceae, Caryophyllaceae, and Convolvulaceae. Some damaged crops in the Soviet Union. A general account was given of the bionom-

ics, importance, and control of these. Important species include *Cassida nebulosa* L., which occurred throughout the Soviet Union and moved from various Chenopodiaceae to sugarbeet; *Cassida nobilis* which attacked sugarbeet, *Chenopodium*, turnip, and rape in European Russia, the Maritime Province, and Kazakhstan; and three others that attacked sugarbeet. *Cassida viridis* occurred in the Maritime Province, *Hypocassida subferruginea* (Schr.) in the south of European Russia, and *Cassida berolinesis* Suffr. in the Groznii region.

046 Brovdii, V. M. 1976. The lucerne leaf-beetle (*Goniocten fornicata* Bruggm.)--a serious pest of lucerne in the southwestern regions of the European part of the Soviet Union. Dopovidi Akademii Nauk Ukrains'koi RSR, B. No. 5, 457-459.

Phytodecta fornicata (Bruggem) (*Gonioctena fornicata*) (Chrysomelidae) which occurred in central and southern Europe, and in the European part of the Soviet Union was found in the Transcarpathian, Chernovtsy, and Odessa areas of the Ukraine and in Moldavia. In the Ukraine and Moldavia, both adults and larvae fed on *Medicago sativa*, *Medicago falcata*, *Medicago romanica*, and *Medicago lupulina*, and occasionally *Trifolium repens* and *Trifolium pratense*. The female laid eggs in clusters on the lower surface of the food plant or on low-growing weeds. In southern Europe, both adults and larvae are parasitized by *Meigenia mutabilis* (Fall).

047 Buhl, C. 1967. *Aceria* (*Eriophyes*) *tenuis* Nal. as a leaf pest on cultivated and wild grasses. *Aceria* (*Eriophyes*) *tenuis* Nal. (Acari, Tetrapodili, Gallmilben) als Blattschadling an Kultur-und Wildgrasern. Nachr Bl. dt. Pflschutzdienst., Stuttg., 19(10):148-149.

The gall mite *A. tenuis* is reported to have attacked a number of grasses at Kitzeberg in the autumn of 1965 and 1966, causing pronounced leaf roll in many instances. During a survey of one field, the mite showed a preference for *Alopecurus pratensis*, *Alopecurus geniculatus*, *Agropyron repens*, *Phleum pratense*, *Dactylis glomerata*, and *Festuca rubra*, but appeared only sporadically on *Agropyron cristatum*, *Agropyron caninum*, *Poa nemoralis*, *Bromus inermis*, *Nardus stricta*, *Deschampsia caespitosa*, and *Hordeum murinum*.

048 Bulyginskaya, M. A. and I. B. Bryantseva. 1969. The selection reaction of adults of the malva moth *Pectinophora malvella* Hb. (Lepidoptera) when ovipositing. Ent. Obozr., 48(1):57-60.

For the past 30 years, *Pexicopia* (*Pectinophora*) *malvella* (Hb.) has been a serious pest of cotton along the middle reaches of the Araks river, in the Soviet Union, from where it has now spread to the whole of Nakhichevan and Soviet Armenia. Studies were carried out in 1959 and 1960 on the selective behavior of various geographical forms of *P. malvella* during oviposition. The moths of the various geographical forms preferred to lay their eggs on the wild species of Malvaceae which predominate in the district from which they were taken for the experiment. Moths from the Norashen district preferred to lay most of their eggs on *Althara taurinensis*, whereas moths from other districts (Lenkaran and Prishib) mainly chose *Althara rugosa* for oviposition.

049 Burgess, L. 1977. Flea beetles (Coleoptera: Chrysomelidae) attacking rape crops in the Canadian prairie provinces. Can. Entomol., 109(1):21-32.

Adults of five species of Chrysomelidae were found attacking rape crops (*Brassica napus* and *Brassica campestris*) in the Canadian prairie provinces from 1971 to 1974. *Phyllotreta cruciferae* was the most abundant and serious pest, fol-

lowed in order by *Psylloides punctulata* and *Phyllotreta striolata*, while *Phyllotreta albionica* and *Phyllotreta robusta* were present only occasionally. The four *Phyllotreta* species confined their feeding largely to cruciferous plants. All five species overwintered as adults. The most serious damage was caused by overwintered adults moving from volunteer rape or cruciferous weed feeding grounds onto seedling crops in the spring.

050 Butani, D. K. 1969. Bionomics and control of sugarcane shoot borer, *Chilo infuscatellus* Snellen. Labdev J. of Science and Technology, 7(2):104-118. Information is given, mostly from the literature on the food plants, morphology, life history, ecology, injuriousness, incidence, and mechanical, cultural, chemical, and biological control of *C. infuscatellus* Sn., which is one of the most common and most injurious pests of sugarcane in India and (unlike other cane borers) is found in all cane growing parts of the country. The alternative food plants (including maize, sorghum, oats, barley, and various grasses) recorded by different Indian authors are enumerated, the times of occurrence and duration of the developmental stages in different Indian states are set out in tables, and an annotated list is given of the Tachinid and Hymenopterous parasites of *C. infuscatellus*.

051 Cadeilhan Giraudet, L. 1968. Study of *Diparopsis tephragramma*, a pest of cotton in Angola. Bolm. Inst. Invest. Cient. Angola, 5(1):5-28.

Diaparopsis tephragramma B.-B. attacked cotton in Angola. The wild food plants of this noctuid were previously unknown, but the author observed it on *Gossypium anomalum*, which grew in semi-arid areas in the extreme southwest of the province.

052 Carnegie, A. J. M. 1967. Report on a visit to Swaziland and a brief review of the present status of *Numicia viridis*, Muir. Mount Edgecombe Exp. Stns. Afr. Sug. Assoc., lt: 18 pp.

Investigations on *N. viridis* Muir on sugarcane in Swaziland were begun in 1962 when it first caused economic damage there. Eggs of *N. viridis* and either adults or nymphs or both were collected on 34 species of grasses and sedges, including maize.

053 Carnegie, A. J. M. 1969. The development of populations of *Numicia viridis* Muir in sugarcane fields. Proc., South African Sugar Technol. Assoc., 43D: 75-84.

Field observations on *N. viridis* Muir, a pest of sugarcane in South Africa and Swaziland, were made in Swaziland in 1966-69 to determine the source of infestation of successive crops of cane. The results indicated that, although eggs, nymphs, or adults sometimes survived the period between the harvesting of one crop and the ratooning of the next, most infestations originated from young adults that flew in from adjacent fields of cane or grass (an alternative food plant).

054 Celli, G. 1970. Study on a moth (*Depressaria marcella* Rebel, Lep. Oecophoridae) injurious to seed crops of *Daucus carota* L. and search for a rational method of control. Studio su di un Lepidottero (*Depressaria marcella* Rebel, Lep. Oecophoridae) dannoso alle coltura da seme di *Daucus carota* L. a ricerca di un metoda razionale di lotta. Bolletino dell Instituto di Entomologia della Universita degli studi di Bologna, 29:1-44.

Severe infestation by *D. marcella* Rebel of carrot grown for seed at Bologna, Italy, was observed for the first time in 1957 and was seen in subsequent years on cultivated and (to a less extent) wild carrot.

055 Chaudhary, J. P. and R. P. Kapil. 1975, publ. 1977. Record of a new host plant of *Hymenia recurvalis* (F.) and its parasites. Indian J. of Entomol., 37(3):314.

In Haryana, India, during 1973-74, infestations by *Hymenia recurvalis* (F). were found on the weeds *Trianthema monogyna, Amaranthus viridis,* and *Amaranthus spinosus* which were growing in fields of cucurbits and okra and uncultivated land and for the first time on lucerne.

056 Chen, C. C. 1969. Studies on the condition of oviposition of rice green leaf hoppers. Plant Protection Bull., Taiwan, 11(2):83-89.

A list is given of 13 species of wild and cultivated plants, in addition to rice on which green rice leafhoppers [*Nephotettix cincticeps* (Uhl.) or *Nephotettix nigropictus* (Stial) (*apicalis* (Metsch)) or both] were observed to oviposit in the Taichung area of Taiwan in 1968.

057 Chernov, V. E. 1976. Ways of reducing the harmfulness of grain sawflies. Zashchita Rastenii, No. 10, p.11.

Yield of winter wheat and other cereals grown in the dry steppe region of the Stavropol area of the USSR has been reduced considerably due to infestation by *Cephus pygmaeus* (L.) and *Trachelus tabidus* (F.). It has frequently been reported that the adult sawflies feed at cruciferous flowers, and the presence of cruciferous weeds was found to increase infestation of wheat.

058 Chiykovski, L. N. 1970. Notes on the biology of the leafhopper *Aphrodes bicincta* (Homoptera: Cicadellidae) in the Ottawa area. Can. Ent., 102(6):750-758.

Observations on the bionomics of *A. bicinctus* (Schr.) in Ontario showed that nymphs first appeared in the field at the end of May or in early June. Early instar nymphs were found on strawberry, red clover (*Trifolium pratense*), alsike clover (*T. hybridum*), and the weeds *Plantago major, Taraxacum officinale, Capsella bursa-pastoris, Erigeron canadensis,* and *Brassica* sp.

059 Choi, S. Y. and H. R. Lee. 1976. Host preference by the small brown planthopper and green rice leafhopper on barley and water foxtail (I). Korean J. of Plant Protection, 15(4):179-184.

Laboratory experiments were carried out in South Korea to clarify the selection of early spring food plants (before the rice crop was ready) by *Laodelphax striatella* (Fall.) and *Nephotettix cincticeps* (Uhl.). The test plants were barley and *Alopecurus aequalis*. The criteria investigated were feeding and oviposition preferences of the insects and their development, life span, and fecundity on these plants as compared with rice. *L. striatella* showed no oviposition preference between the test plants, but the nymphs preferred barley to *A. aequalis* for feeding, grew significantly faster, and had a higher percentage of adult emergence. Adults lived longer and laid more eggs on barley than on *A. aequalis* or rice. *N. cincticeps* greatly preferred rice to either of the alternative food plants for oviposition. No adult emergence occurred on barley

and little on *A. aequalis*, on which the adults had shorter lives and lower fecundity than on rice.

060 Chon, T. S., J. S. Hyun, and C. S. Park. 1975. A study on the population dynamics of overwintered small brown planthopper, *Laodelphax striatellus*. Korean J. Entomol., 5(2):21-32.

Periodical surveys on *L. striatella* were conducted during 1973-75 with a suction catcher at four sites in the Suweon area, Korea. Grasses, especially *Agropyron kamijo* (Gramineal.), appeared to be important hosts for overwintering *L. striatellus*.

061 Choudhury, A. K. S. and A. B. Mukherjee. 1972. Wild plants as alternate hosts of red spider mite, *Tetranychus telarius* (Linnaeus) (Tetranychidae: Acarina). Indian J. of Entomol., 33(1):108-110, 1972.

In January 1968 at Kalyani, West Bengal, India, *Tetranychus urticae* Koch (*telarius* Auct.) was found on 14 named species of wild plants in nine families: *Amaranthus viridis* L., *Cannabis sativa* L., *Chenopodium murale* L., *Chenopodium album* L., *Tridax procumbens* L., *Sonchus arvensis* L., *Sonchus oleraceus* L., *Ageratum conyzoides* L., *Cichorium intybus* L., *Brassica kaber* (Stokes), *Melilotus indica* All., *Withania somnifera* Dun., *Solanum nigrum* L., and *Lantana camara* L. From 3.2% to 100% of the leaves were infested. Later, the mite transferred to cultivated plants and populations on the weeds declined.

062 Cho, Y. I. Ecology of rice borers in Taiwan. Tropical Agriculture Research Series (undated), No. 5:155-162.

Chilo suppressalis has become the principal pest of rice in Taiwan. Adults of the second generation seek alternative food plants, such as "paddy" sugarcane and *Zizania aquatica* (water oats), and the adults of the third generation move from these plants to rice. The larvae of the fourth generation overwinter in rice stubble and *Z. aquatica*.

063 Ciochia, V. and D. Mustatea. 1977. Aspects of the dynamics of appearance and control of the beet weevil (*Bothynoderes punctiventris*). Aspecte ale dinamicii aparitiei si combaterii gargaritei sfeclei (*Bothynoderes punctiventris*). Cereale si Plante Tehnice, Productia Vegetala, 29(2):35-39. Institutul de Cercetari pentru Cultura Cartofului si Sfeclei, Brasov, Romania.

B. punctiventris migrates to and lives on certain wild plants when beet is not available.

064 Cordingley, C. L. and W. Danthanarayana. 1976. The lepidopterous fauna of capeweed (*Arctotheca calendula*) in Victoria with keys for larval identification. J. of Australian Entomol. Soc., 15(1):19-34.

The larvae of 11 species of Lepidoptera (including *Epiphyae postvittana* and several other species of economic importance), belonging to six families, were found infesting *A. calendula* in Victoria in 1972 in connection with studies on the biology of *E. postvittana* (Wik.) on apple.

065 Costilla, M. A., H. J. Besco, C. A. Levi, and U. M. Osores. 1973. The looper *Mocis latipes* (Gueni) and its importance as a pest of sugarcane. Biology, damage and control. La Cruga Cuarteadara Mocis latipes (Guen.) y su importancia

como plaga de la cana de ezucar. Biologia, dano y control. Boletin, Estacian Experimental Agricola de Tucuman, 112:7.

All stages of *M. latipes* (Gn.) are described. This noctuid, which is widely distributed in South and Central America, attacks Graminaceae, including sorghum, maize, and rice. In Argentina, outbreaks have occurred at intervals on sugarcane and other crops, and serious damage was caused in sugarcane fields in the province of Tucuman in 1967, 1969, and 1973. Infestation usually spreads to sugarcane from weeds. Both the crop itself and the borders of the fields should therefore be kept free from weeds, especially *Digitaria sanguinalis*, which is much favored by the moth.

066 Costilla, M. A. and D. H. Mercado. 1968. The variate caterpillar *Spodoptera frugiperda* and its importance on crops in Tucuman. Boln. Estac. Exp. agric. Tucuman, 107:4 pp.

The author briefly described all stages of *Spodoptera* (*Laphygma*) *frugiperda* (J. E. Smith), which occurred widely in Argentina and caused severe damage, especially during the summer months, in the province of Tucuman, where it has two to four generations a year. Its main food plants were listed and include maize, sorghum, sugarcane, lucerne, and soybean; sunflowers (*Helianthus*) in the vicinity of heavily infested weeds have also been severely damaged.

067 Cunningham, I. C. 1969. Alternative host plants of tobacco leaf-miner (*Phthorimaea operculella* (Zell.)). Qd. J. Agri. Anim. Sci., 26(1):107-111.

Field and laboratory studies on the food plants of *Phthorimaea operculella* (Zell.) were carried out in northern Queensland. All the recorded food plants, both economic and wild, were solanaceous and most were species of *Solanum*. Wild food plants in the tobacco growing districts were often heavily infested with *P. operculella*. These, together with self-sown tobacco plants, were important in maintaining populations of *P. operculella*, especially where winter temperatures were mild. The following are hosts of *P. operculella* in Queensland:

With slight average infestation:

Capsicum frutescens (Chilli)
Nicotiana goodspeedii
Nicotiana suaveolens
Physalis peruviana (Cape-gooseberry)
Solanum mammosum
Solanum nigrum (complex)

With moderate average infestation:

Datura metel
Datura stramonium
Nicandra physalodes
Nicotiana amplexicaulis
Nicotiana debneyi
Nicotiana glauca
Nicotiana megalosiphon
Physalis sp. (possibly *minima*)
Solanum aculeatissimum
Solanum melongena (eggplant)
Solanum torvum

With severe average infestation:

Lycopersicon esculentum (tomato)
Nicotiana tabacum (tobacco)
Solanum mauritianum
Solanum tuberosum (potato)
Solanum verbascifolium

In many countries it appears as a pest of the following cultivated plants: tobacco, potato, tomato, Cape-gooseberry, eggplant, and chili. It has also been recorded from the following wild hosts: in America, *Solanum carolinense, Solanum nigrum, Solanum paniculatum, Solanun torvum, Solanum verbascifolium, Datura stramonium, Physalodes physaledes;* in Europe, *Solanum commersoni, Solanum dulcamara, Solanum maglia, Solanum miniatum, Nicotiana sylvestris, Fabina imbricata, Hyoscyamus albus, Lycium europeum;* in South Africa, *Datura stramonium;* in the East Indies, *Solanum nigrum, Solanum torvum, Datura stramonium, Datura suaveolens, Physalis angulata;* in Brazil, (State of Sao Paulo), *Nicotiana glauca, Nicotiana glutinosa, Nicotiana langsdorffii, Nicotiana nudicaulis, Nicotiana paniculata, Nicotiana rustica, Nicotiana rustica* var. *amarella, Nicotiana rustica* var. *brasilia, Nicotiana rustica* var. *humilis, Nicotiana sylvestris, Solanum melongena.*

068 Daborowski, Z. T. and A. Marezak. 1972. Studies on the relationship of *Tetranychus urticae* Koch and host plants. I. Effect of plant species. Polskie Pismo Entomologiezne, 42(4):821-855.

Laboratory studies were made in Poland on the effects of different food plants on the development, survival, and fecundity of *T. urticae* Koch. They were made in a climatic chamber at 25° C and 75% R.H. with 33 species of plants comprising ten greenhouse plants, ten flowering plants, three vegetables, four weeds, two tobacco varieties, and five species of trees and shrubs. A marked preference was noted for *Rosa dilecta* and *Heliopsis helianthoides* var. *scabra,* on which the females laid averages of more than 100 eggs each. A preference was also shown for *Convallaria majalis, Cineraria cruenta, Chrysanthemum morifolium, Convolvulus arvensis,* and *Tilia platyphyllos,* on which the females laid averages of 35-50 eggs each.

069 Danthanarayana, W. 1968. The distribution and host-range of the shot-hole borer (*Xyleborus fornicatus* Eichh.) of tea. Tea Quarterly, 39(3):61-69.

A list was given of the food plants (showing their economic importance) and distribution of *X. fornicatus* Eichh., together with the authorities for the references, in India, Ceylon, Burma, Malaysia, Indonesia, and Formosa. It attacks 99 plant species in 36 families, preferring the Leguminosae, Verbenaceae, Moraceae, and Euphorbiaceae.

070 Das, M. S. and B. H. Patnaik. 1971. A new host of the brinjal shoot and fruit borer *Leucinodes orbanalis* Guen and its biology. J. of the Bombay Natural History Society, 67(3):601-603.

Leucinodes orbanalis Gn., a serious pest of brinjal (*Solanum melongena*) was also observed to bore into the shoots and fruits of tomato in Bhubaneswar, India. The insect was found to be able to complete its development on tomato and also on the weed *Solanum nigrum,* but moths that had been reared on the latter were smaller and laid fewer eggs than those reared on tomato or *S. melongena.*

071 Dean, G. J. W. 1968. Studies of factors affecting the formation of hopper bands of the red locust (*Nomadacris septemfasciata*) in an outbreak area. J. Appl. Ecol., 5(2):273-290.

Studies were carried out in 1958-62 on some of the factors that affect the formation of bands of hoppers of *N. septemfasciata* (Seru.) in the North Rukwa plain of the Rukwa Rift Valley outbreak area in Tanganyika. The densities of egg pods and hatching hoppers were generally small in the years of the study but concentration occurred in areas of grasslands that had been burned during the previous dry season. They were larger in lawns of short *Cynodon* forming a mosaic with tall *Echinochloa* than in other habitats. Hoppers were more aggregated in the mosaic than in extensive uniform *Cynodon* lawns, while homogeneous, tall *Echinochloa-Cyperus* stands were intermediate in this respect.

072 Decazy, B. 1974. Seasonal variations of populations of *Boxiopsis madagascariensis* Lavabre, a Mirid pest of cacao in Madagascar. (Preliminary note.) Les varaiations saisonnieres des populations de *Boxiopsis madagascariensis* Lavabre, miride ravageur du cacaoyer a Madagascar (Note preliminaire). Cafe Cacao, 18 (4):255-262.

Prior to extending the cultivation of cacao on the east coast of Madagascar, observations were carried out there in 1972-73 on *B. madagascariensis* Lavabre, a potentially important pest. This mirid was found not only on cacao but also on *Flemingia congesta*, which is used as a shade tree for young cacao, and on a malvaceous wild plant, *Urena lobata*. Its development was similar on all three food plants.

073 Decker, G. C. and J. V. Maddox. 1971. Observations on the bionomics of *Simyra henrici*. J. Econ. Entomol., 64(1):117-122.

The potential of *Simyra henrici* (Grote) as a pest of corn and other graminaceous crops was discussed. Larvae were collected from *Polygonum* sp., *Typha* spp., willow (*Salix* sp.), maize (on which they occasionally became a pest), wheat (*Triticum aestivum*), rye (*Secale cereale*), timothy (*Phleum pratense*), Kentucky bluegrass (*Poa pratensis*), orchardgrass (*Dactylis glomerata*), and canary grass (*Phalaris canariensis*).

074 Dhanarajan, G. 1976. Some observations on the teak collar ring borer--*Endoclita gmelina* (Lepidoptera: Hepialidae) in northwestern Malaysia. Malaysian Forester, 39(4):214-223.

Endoclita gmelina Tindale is a pest of some importance in experimental teak plantations in West Malaysia. The damage was usually confined to saplings and sometimes resulted in death. Preventive control measures suggested for the protection of young plantations comprise the removal of *Lantana* and *Eupatorium* plants from the vicinity and the application of tanglefoot to the base of the young trees where attack normally begins.

075 Dickson, R. C. and E. F. Laird, Jr. 1969. Crop host preferences of greenbug biotype attacking sorghum. J. Econ. Entomol., 62(5):1241.

Investigations were carried out in the greenhouse in California to determine the food plant preferences of a new biotype of *Schizaphis graminum* (Rand.) that became a severe pest of sorghum in the United States, beginning with Nebraska, in 1968. Colonies were absent or very small on half the plants of "Moregrain" oats, which indicated some antibiosis in that variety. When this variety was

omitted from the analyses, there were no significant differences among oat varieties. Similarly, there were no significant differences among the wheat, barley, or sorghum varieties. Barley was a significantly better host than wheat, oats, or sorghum. Colony size was significantly larger on wheat than on sorghum at the 5% level, but was not significantly different from that on oats, which in turn did not differ significantly from that on sorghum. Sudangrass (*Sorghum sudanense*) was as good a food plant as grain sorghum, while development on *Sorghum halepense* was similar to that on the poorer sorghums. Rice, maize, Bermuda grass (*Cynodon dactylon*), *Echinochloa crus-galli*, annual ryegrass (*Lolium multiflorum*), and perennial ryegrass (*L. perenne*) were poor food plants.

076 Dimetry, N. Z. 1971. Studies on the host preference of the cotton seed bug *Oxycarenus hyalinipennis* Costa (Lygaeidae: Hemiptera). Zeitshcrift fur Angewandte Entomologie, 68(1):63-67.

Oviposition and feeding by *O. hyalinipennis* occurred almost exclusively on seeds of members of the Malvaceae. A study on host preference revealed that of 12 species used in an acceptance and growth survey, 8 were acceptable and supported growth to a greater or lesser extent and 4 failed to support growth. *Hibiscus cannabinus* ranked first among the plant seeds tested regarding survival and duration of the nymphal stage and fecundity and length of life of the adult. Cotton seedlings 15-20 days old failed to support growth of the nymphs. The seeds chosen by the insects for oviposition correlated very well with those on which they preferred to feed. Those seeds on which the insects oviposited were also those on which the nymphs could feed, develop to maturity, and adult females could produce eggs. The following seed plants supported growth: *Gossypium barbadense, Hibiscus esculentus, Hibiscus cannabinus, Malva rotundifolia, Hibiscus sabdariffa, Sida mollis, Hibiscus trionum,* and *Sphoeralcea umbellata.* The following seed plants did not support growth: *Althaea rosea, Abutilon fruticosum, Pavonia spinifer,* and *Sphoeralcea umbellata.*

077 Dimic, N. 1971. Leaf miners--pests of hazel. Mineri lista-stetocine lijeske. Zastita Bilja, 22(112/113):105-113.

Leaf miners were collected in Bosnia and Herzegovina (Yugoslavia) from cultivated hazel (*Corylus avellana*) at 2 sites and from wild plantations at 85 sites. Of the nine species found, the most widespread and injurious were *Parornix avellanella* (Stnt.), *Phyllonoryeter* (*Lithocolletis*) *nicellii* (Stnt.), and *P.* (L.) *coryli.* (*V. nicelli*).

078 Dochkova, B. 1969. The effects of food plants on the development and fecundity of the tomato moth. Rastenievudni Nauki, 6(9):127-134 (in Russian).

Diataraxia (*Mamestra*) *oleracea* (L.), which is polyphagous, occurred in considerable numbers in Bulgaria in 1965-66, a population density of up to 42 larvae m^2 being noted on a beet crop. Laboratory investigations were made in 1967 at 25.7° C and 78.3% R.H. to determine the effects on the development and fecundity of the moth when the larvae were fed from the time of hatching to pupation on *Chenopodium album, Polygonum convolvulus,* beet, lucerne, sunflower (*Helianthus annuus*) or *Amaranthus retroflexus. P. convolvulus* followed beet as the most favorable host of *M. oleracea.*

079 Domenichini, G. 1968. *Psylla melanonevra* Foerster in North Italy. La *Psylla melanonevra* Foerster (Homoptera) nel Nord Italia. Boll. Zool. Agr. Bachic, (Ser II.) 8(1966-67):169-180.

During observations on the arthropod fauna of apple orchards near Varesa, in the north, *Psylla melanonevra* (Forst.) was found in Italy for the first time. The adults overwintered on conifers and in mid-March flew to apple, pear, and *Crataegus*, where they paired and gave rise to a single generation of which the young adults appeared in May and had returned to conifers by late June. Supplementary observations indicated that these migrations were necessary for sexual maturation, more because of the flight exercise than the ensuing change in diet.

080 Donchev, K. 1968. A contribution to the Thysanoptera of Bulgaria. Rast. Vud. Nauki, 5(6):89-97.

Thrips were collected in 1963 at ten localities in Bulgaria from the flowers of cultivated and wild fodder plants. Twenty-three species and two forms are listed, with brief details of their food plants, geographical distribution, and bionomics. Ten species and two forms were new records for Bulgaria.

081 Douglass, J. R. and H. C. Hallock. 1957. Relative importance of various host plants of the beet leaf hopper in southern Idaho. U.S. Dept. Agr., Tech. Bull. 1155, 11 pp.

A study was made of 43 plant species, mostly Chenopodiaceae or crucifers, as spring and summer food plants of *Circulifer tenellus* in southern Idaho.

082 D'Sauza, G. I., P. K. Bhat, and D. Balarammenon. 1969. *Canthium dicoccum* Gaertn. Merr (Rubiaceae) and *Alstonia scholaris* Br. (*Apocyanecae*)--two new hosts of the greenbug (*Cocus viridis* Gr.) in South India. Indian Coffee, 33(2):65.

083 Duran, M. 1974. Report on sunn pest (*Aelia rostrata* Boh.) situation in central Anatolia. Cereal Pest Laboratory, Plant Protection Institute, Ankara, Turkey, pp. 169-173. The article can be found in: Report, CENTO Scientific Programme (1976, recd. 1978) No. 22, +88 pp.

Aelia rostrata Boh. is a major pest of cereals (especially wheat and barley) in central Anatolia in Turkey. Populations are mixed in some areas with *Eurygaster maura* (L.). *A. rostrata* overwintered under a great variety of plants such as *Quercus* spp., *Pinus nigra, Daphine oleoides, Acantholimon venustrum, Asphodeline isthomocarpa,* and *Astragalus* spp. at altitudes of 1000-2000 m.

084 Du Rant, J. A. 1969. Seasonal history of the European corn borer at Florence, South Carolina. J. Econ. Entomol., 62(5):1071-1075.

Studies were conducted in South Carolina in 1967-68 on the seasonal history of *Ostrinia nubilalis* (Hb.) on maize sown on different dates. There were four generations during the year. Adult emergence began in April. Deposition of the first, second, and third generation eggs was heaviest on maize sown in March, April, and May, respectively, with the eggs of the fourth generation being laid mainly on *Panicum* sp.

085 Dusek, J. 1969. Anthomyiids injurious to cereal crops. Sb. vys. sk. zemed. Brne., (4)17(1):127-137.

In studies in Czechoslovakia in 1964-66, larvae of four Anthomyiids were found injuring cereal crops. *Hylemya* (*Phorbia*) *coarctata* (Fall.) was injurious to

wheat and to a less extent rye and barley, but not oats. It also occurred on various grasses.

086 Dyadyechko, N. P. 1968. The turnip moth in the Ukraine. Zashch. Rast., 13(7):29-30.

Tests on the control of the turnip moth (*Agrotis segetum* (Schiff.)) were carried out in 1965-67 in the Ukraine. The adults from overwintered larvae emerged in the second half of May and oviposited on weeds, and the first generation larvae attacked crops in June.

087 Eguagie, W. E. 1973. A *Crematogaster* sp. (Hym. Formicidae) attacking *Cola nitida* (Sterculiaceae) in Western Nigeria. Bull. of Entomol. Research, 62(3): 527-531.

The flowers, leaves, young branches, and pods of *C. nitida* were attacked by *Crematogaster buchneri* Forel at Gambari Experimental Station, Nigeria. *C. buchneri* attacked 12 species of wild plants in the *Cola* plot, but when caged with plants in the laboratory, the ants attacked only *Phyllanthus floribunda* and *Cola caricifolia*. The ants tend *Coccus hesperidum* L. and make small greyish-black nests of earth mixed with fine grass in crevices between the main veins of leaves, at leaf nodes, or by terminal buds. In addition to *P. floribundus* and *C. caricifolia*, the following wild plants were attacked: *Albizia zygia, Chlorophora excelsa, Cnestis ferruginea, Ficus vogeliana, Lecaniodiscus cupanioides, Leea guineensis, Rauwolfia vomitoria, Solanum verbascifolium, Tragia* spp., and *Triplochiton nigericum*. Nests were found on: *C. excelsa, C. caricifolia, F. vogeliana, L. cupanioides, Tragia* spp., and *T. nigericum*.

088 El-Kaday, E. A., M. S. Hassan, and A. A. Attia. 1971. The biology of the mealy plum aphid, *Hyalopterus pruni* (Geoffroy), in Egypt (Hemiptera-Homoptera: Aphididae). Bull. de la Societe Entomologique d'Egypte, 54:529-540.

Hyalopterus pruni (Geoffr.) appears to be the most important pest of peach and apricots in Egypt. Its bionomics were studied in the field at Dakki in 1965-66 on its alternative food plant *Phragmites communis*.

089 Elshafie, M. 1976. *Nysius vinitor* Berg. (Hemiptera: Lygaeidae) infesting pigweed, *Portulaca oleracea* L. J. of the Entomol. Soc. of Australia (N.S.W.), 9:54.

From observations in citrus, peach, and apple orchards in New South Wales, *P. oleracea* is added to the short list of known weeds that are food plants of *N. vinitor*, a pest of many cultivated plants. The lygaeid was reared from nymph to adult in the laboratory on seeds of *P. oleracea*.

090 Encarnacion, D. T. 1970. Biology of the cotton stainer, *Dysdercus cingulatus* Fabricius (Pyrrhocoridae, Hemiptera). Philippine Entomologist, 1(5):341-349.

The biology of *D. cingulatus* (F.) was investigated in the Philippines, where the insect is a pest of okra (*Hibiscus esculentus*) and cotton. The insects were found to be abundant throughout the year on okra and also occurred on cotton, kapok (*Ceiba pentandra*), kenaf (*H. cannabinus*), jute (*Corchorus acutangulus*), and some wild malvaceous plants.

091 Faber, W. 1970. Is the saddle fly coming? Pflanzenarzt., 23(6):55-57.

Notes were given on the distribution and bionomics of *Haplodiplosis equestris* (Wagr.), which has gradually become more common on wheat, barley, and *Agropyron repens* in various parts of Austria.

092 Faseli, M. D. 1977. Investigations on the biology, ecology and control of *Erias insulana* Boisd. (Noctuidae). Entomologie et Phytopathologie Appliquees, No. 43, Pe 39-54; de 6-7 (Pe, de, 2 ref., 3 fig.). Plants, Pests and Diseases Research Laboratory, Maschhad, Iran.

In the south Khorrasan region of Iran, *E. insulana* (Boisd.) on cotton had six generations. The pupae overwintered and the adults emerged at the beginning of March. *E. insulana* caused about 80% damage to cotton in the region, but the first generation developed mainly on *Malva* spp. and also on *Althaea* spp., *Hibiscus trionum*, and *Abutilon avicennae*. It was observed that individuals developing on Hibiscus pods laid more eggs than did those developing on cotton bolls, and populations infesting the late cotton crop were more abundant than those infesting the early crop, which was harvested sooner. Populations were also affected by the weather. Very high pupal mortality resulted from 190 hr or more of temperatures below 0° C. Precipitation had a considerable indirect effect on the first generation of *E. insulana*. Rainfall of more than 100 mm, with a good proportion of it falling in the spring, permitted the growth of Malva spp., on which the first generation of bollworms largely depended. Recommended control measures, as well as chemical treatments, therefore include early sowing of cotton so as to permit a harvest at the end of May, removal of *Malva* and *Hibiscus* from the vicinity of cotton plantations, and deep ploughing and removal of cotton plant debris in the winter.

093 Fed'ko, I. A. and V. N. Pisarenko. 1977. Control of the common *Lethrus* species. Zaschita Rastenil, No. 6, pp. 20-21.

Adults of the scarabaeid *L. apterus* (Laxmann) caused severe injury to the aerial parts of maize in the Steppe zone of the Ukraine (USSR). Observations in 1972-75 showed that beetles appeared in the second half of April and fed on weeds until maize shoots were available, when they migrated to these, delaying plant development and reducing yield.

094 Fedoseeva, L. I. 1969. *Meromyza nigriventris* (Diptera, Chloropidae)--its systematic position, development and injuriousness. Zoologicheskii Zhurnel., 48 (5):701-708.

Further studies in which extensive collections from the Soviet Union, Japan, and China and observations in the Moscow region were compared, confirmed, and differentiated between *Meromyza nigriventris* Macq., which infests cereals and grasses, and *Meromyza saltatrix* (L.), which develops mainly in the stalks of *Poa* spp. *M. nigriventris* overwinters as full-fed larvae at the base of the stalks of winter cereals or wild grasses. More than 20 species of wild grasses are listed from the literature as food plants of *M. nigriventris*, but the author found the larvae only in the stalks of *Agropyron repens* and *Lolium perenne*.

095 Feeny, P., K. L. Paawe, and N. J. Demong. 1970. Flea beetles and mustard oils: host plant specificity of *Phyllotreta cruciferae* and *P. striolata* adults (Coleoptera: Chrysomelidae). Ann. Entomol. Soc. Am., 63:832-841.

Insect samples taken from field plots of plants representing 23 families in New York State in 1968 indicated that adults of *P. cruciferae* (Goeza) and *Phyl-*

lotreta striolata (F.) have a narrow food plant range, restricted among the plants tested to the families Copparidaceae, Cruciferae, and Tropaeolaceae. These flea beetles are serious pests of crucifer crops in the eastern U. S. The adults are active in early spring, when they disperse and seek out their crucifer hosts, at first chiefly weeds, but later also cultivated crops. Plants of the family Limnanthaceae are also attacked by *P. cruciferae*. In the field experiments it was obvious from the data that by far the majority of the flea beetles of both species were found on the subplots of the two species of Cruciferae (broccoli and mustard). The numbers and distribution of beetles on plots of the other plant species were such as to suggest that these beetles were merely casual visitors to these plants.

096 Ferino, M. P. 1968. The biology and control of the rice leaf-whorl maggot, *Hydrellia philippina* Ferino (Ephydridae, Diptera). Philippine Agriculturist, 52(6):332-383.

All stages were described and information was given on the bionomics, seasonal abundance, distribution, natural enemies, and chemical control of *Hydrellia philippina* Ferino. This recently recorded pest of irrigated rice in the Philippines was already known in Japan and India. Besides rice, *H. philippina* was observed to attack seven species of graminaceous weeds growing near water, and these appeared to act as alternative food plants when rice in the susceptible stage was not available. The following weeds are believed to serve as alternative hosts: *Brachiaria distachya, Cynodon dactylon, Echinochloa colonum, Leersia hexandra, Leptochloa chinensis, Panicum repens,* and *Pennisetum clandestinum*.

097 Finch, S. and C. M. Ackley. 1977. Cultivated and wild host plants supporting populations of the cabbage root fly (*Erioischia brassicae*: Dipt., Anthomyiidae). Ann. Appl. Biol., 85(1):13-22.

To determine the relative importance of different potential host plants for supporting populations of *E. brassicae,* wild and cultivated crucifers were sampled for pupae at four locations during 1971-73. In the field, most pupae (28.7/plant) were collected from untreated cauliflowers. Fewer pupae (1.7-8.6/plant) were obtained from untreated crops of Brussels sprouts, cabbage, and swede. Of five common weed species sampled, only *Raphanus raphanistrum* produced as many pupae as certain of the untreated brassica crops. Pupae did not occur in samples from *Capsella bursa-pastoris,* but *Sisymbrium officinale, Thlaspi arvense*, and *Sinapis arvensis* usually supported low numbers. Most pupae were obtained from 12-week plants of *Barbarea intermedia, Barbarea stricta, Brassica nepus, Cochlearia officinalis,* and *R. raphanistrum* and from 24-week plants of *Brassica rapa, Erysimum aureum, Cochleria anglica,* and *Cochleria officinalis. Barbarea vulgaris* also hosted the insect. Arguments for and against the removal of cruciferous weeds from the vicinity of cruciferous crops are discussed.

098 Foott, W. H. 1968. The importance of *Solanum carolinense* L. as a host of the pepper maggot *Zonosemata electa* (Say) (Diptera: Tephritidae) in southwestern Ontario. Proc., Entomol. Soc. Ont., 98(1967):16-18.

Zonosemata electa, a pest of peppers in Ontario, has recently been found also in the fruits of a weed (*Solanum carolinense*). The bionomics of the Tephritid on the two plants were compared and insects reared on one plant were confined with the other in order to determine whether two separate races exist and whether cross infestation could occur. There was no evidence that two distinct

races had evolved, and individuals reared on one plant oviposited and gave rise to viable offspring that reached pupation on the other. *S. carolinense* was found to be infested also by *Leptinotarsa decemlineata* (Say), flea beetles, and in one case the Gelechiid *Frumenta nundinella* (Zell.) (which had not previously been known in Canada) and the weevil *Trichobaris trinotata* (Say). The weed was not sufficiently common to present a problem, but evidence was found that it sustained breeding populations of *Z. electa* after the Tephritid had been cleared from pepper fields by insecticide treatment. There was one example of 90% infestation and crop loss of peppers planted in newly reclaimed pastureland that had contained *S. carolinense*.

099 Foott, W. H. and P. R. Timmins. 1971. Importance of field corn as a reproductive site for *Glischrochilus quadrisignatus* (Say) (Coleoptera: Nitidulidae). Proc., Entomol. Soc. of Ontario, 101:73-75.

A survey of unploughed maize fields in southwestern Ontario in the spring of 1969 and 1970 showed maize ears missed by harvesting machinery to be the principal reproductive sites for *G. quadrisignatus* (Say), a serious pest of several fruit and vegetable crops in the locality.

100 Furtunov, Kh. 1976. *Haplodiplosis equestris* Wagner. Rastitelna Zashchita, 24(6):28-29.

The life history of *Haplodiplosis marginata* (Roser) (*equestris* (Wagn.)) as to the time of larvae pupation, adult emergence, oviposition, and hatching of larvae was studied in 1974 and 1975 under field conditions in Bulgaria. Eggs were laid on the topmost leaves of wheat, maize, *Phaseolus*, and weeds, such as *Avena* and *Setaria* spp.

101 Gallego, C. 1975. The problem of cereal bugs in Spain. El problema de los chinches de los cereales in Espana. 52-56 (Es, 8 ref.). Departamento de Proteccion Vegetal, Istituto Nacional de Investigaciones Agrarias, Madrid-3, Spain.

The most common cereal bugs in Spain are *Aelia* spp. *Aelia rostrata* Boh. is known in Old Castile and Aragon, *Aelia acuminata* (L.) in Old Castile and Andalusia, and *Aelia germari* Kust. in Andalusia alone. For hibernation they appeared to prefer sites containing *Genista* spp., *Arctostaphylos uva-ursi*, and various wild grasses.

102 Gameel, O. I. 1972. A new description, distribution and hosts of the cotton whitefly *Bemisia tabaci* (Gennadius) (Homoptera Alayrodidae). Revue de Zoologie et de Botanique Africaines, 86(1/2):50-64.

Stages of *B. tabaci* (Gennadius), information on its synonymy and world distribution, and a list of 115 species of plants of 31 families on which immature and adult forms of the Aleyrodid were observed in the Sudan in 1970-71 were reported. The crops on which it was found in summer and autumn included cotton, groundnuts, and kenaf (*Hibiscus cannabinus*), and those infested in summer included pepper (*Capsicum annuum*), tomato, egg-plant (*Solanum melongena*), and beans (*Phaseolus vulgaris*). The author stresses the importance of wild plants on which large populations of the Aleyrodid can build up.

103 Gaponova, A. F., T. P. Zhukova, and S. I. Strukova. 1975. The food relations of the beet root aphid. Zashchita Rastenii, No. 7, p 47.

Pemphigus fusicornis (Koch) (beet root aphid) is a fairly recent but very important pest of beet in the Soviet Union. It occurs not only on all the forms of beet but also on chenopodiaceous weeds, and has been reported on certain composites. However, there are other species of *Pemphigus* that infect composites and closely resemble *P. fusicornis*.

104 Gargav, V. P., O. P. Katiyar, and R. K. Patel. 1972. A new record of alternate host of armyworms. J. of the Bombay Natural History Society, 69(1):213-214.

Mythimna (Pseudaletia) separata (Wlk.) and *Mythimna (Cirphis) lareyi* (Dup.) are known in India as important pests of rice and other crops (especially Graminaceae), which are listed. In the Raipur district of Madhya Pradesh, larvae of both species were found feeding on *Eriocaulon sexangulare*, a weed growing profusely in rice fields in the area. In the laboratory, larvae reared on rice readily accepted *E. sexangulare* and populations collected on the weed migrated to rice, but it appeared that the weed was slightly more acceptable to larvae in the earlier instars and rice to the older ones. This is the first record of *E. sexangulare* as an alternative food plant for *M. separata* and *M. lareyi*.

105 Genduso, P. 1977. Grain pentatomids in Italy and investigations on the biocoenoses in the newly sown fields and shelter vegetation. I pentatomidi del grano in Italia e ricerche sulla biocenosi nei seminativi e nella vegetazione rifugio. 59-74 (It, 6 ref., 3 col. pl., 16 fig.). Istituto di Entomologia Agraria, Palermo, Sicily, Italy.

Following an outbreak of *Aelia rostrata* (Boh.) in wheat in Sicily in 1974-75, a detailed study was made in 1975 of the aestivation and hibernation sites and also of fields newly sown with wheat. *Dolycoris baccarum* (L.), *Eurygaster maura* (L.), and *Eurygaster austriaca* (Schr.) were also present, although in smaller numbers. As a result of this study, five alternative food plants and 30 species of shelter plants (not necessarily food plants) are listed that were found to be harboring numerous adults on mountains of the Madonie region and on Mount St. Calogero (more than 1300 m above sea level). Attention is drawn to the necessity of studying the ecosystems of wheat fields and of aestivation and hibernation sites before work is begun on integrated control.

106 Genduso, P. and A. di Martino. 1978. On a severe infestation by Pentatamidae of wheat in Sicily and on their refuge plants. Su una grave infestazione di pentatomidi del frumento in Sicilia e sulla vegetazione rifugio. Bollettino dell'Istituto di Entomologia Agraria e dell'Osservatorio di Fitopathologia di Palermo (1974/1975/1976, recd. 1978) 9, 81-100 (It, fr, en, 23 ref., 19 fig.). Istituto di Entomologia Agraria, Universita, degli Studi, Palermo, Sicily, Italy.

In 1974, an extraordinarily heavy outbreak of Pentatomidae, such as had not been recorded on the island before, occurred in central and northern Sicily. The predominant species was *Aelia rostrata* Boh. in most places, but in some localities equal numbers of *A. rostrata* and *Dolycoris baccarum* (L.) were observed, and occasional examples of *Eurygaster* spp. were found. Wheat and to a less extent barley were the main economic plants damaged. Other plants in the vicinity, including trees, shrubs, grasses, and herbaceous plants, became heavily infested as aestivation and hibernation sites from July onwards at altitudes of 1200-1900 m, and 17 species of those on which large numbers of *Aelia* and *Dolycoris* adults were found are enumerated.

107 Goeden, R. D. 1968. Russian thistle as an alternate host to economically important insects. Weed Sci., 16(1):102-103.

The results of a recent survey of the phytophagous insect fauna of Russian thistle (*Salsola kali* var. *tenuifolia*) in southern California showed that a number of economically important insects may use this weed as an alternative feeding and/or breeding host. A total of 91 phytophagous insects representing 6 orders and 25 families were collected from Russian thistle during 1965 and 1966 and those of economic importance are listed. Of these insects, the beet leafhopper is the only one of which *S. kali* merits serious consideration as an economically significant, alternative host.

108 Goksu, M. E. and E. D. Atak. 1972. Investigations on the two-spotted red spider mite (*Tetranychus urticae* Koch), *Thrips* spp., and *Aphis* spp. on vegetables in the Marmara region. Marmara bolgesi sebzelerinde iki benekli orumcek (*Tetranychus urticae* Koch), *Aphis* spp. ve *Thrips* spp. in mucadelesi uzerinde arastirmalar. Bitki Koruma Bulteni, 12(1):11-35.

Tetranychus urticae Koch, *Thrips* spp., and *Aphis* spp. cause much damage to vegetable crops in the Marmara and Thrace regions of Turkey, particularly during the summer, but many growers fail to recognize the infestation and attribute the losses in yield to unfavorable weather. Adults of *T. urticae* overwintered in the soil, among leaf litter, or on weeds. Under optimum conditions, development was continuous throughout the winter. Populations increased on weeds in spring and the mite later moved to vegetable crops such as beans (*Phaseolus vulgaris*), cucumber, and squash.

109 Gokulpure, R. S. 1972. Note on the hosts and parasites of *Phytomyza atricornis* Meigen. (Diptera: Agromyzidae). Indian J. of Agricultural Sciences, 42(7):638-640.

A list is given of 40 cultivated and wild plant species, belonging to 16 families, on which larvae of *Phytomyza horticola* Goureau (*atricornis* Mg.), a pest of peas, were found in the field in Madhya Pradesh and Uttar Pradesh, India, in 1966-68.

110 Golikov, V. I. and A. S. Kosmachevskii. 1972. The beet root aphid. Zashchita Rastenii, 17(3):35-36.

Wingless females overwintered on the roots of *Chenopodium* spp. and beets, on the post-harvest remains of sugarbeets, and also on the roots of seed-beets kept in trenches. To eradicate natural foci, chenopodiaceous weeds should be destroyed.

111 Gorbatyuk, N. M. 1971. The ways in which the root aphid colonizes sugar-beet plantations. Kishnnev, Izdatel; stvo Shtiintsa, Moldavian SSR, pp. 66-71.

Investigations in Soviet Moldavia in 1967-69 showed that sugarbeet became infested by *Pemphigus fusicornis* (Koch) through the spread of first-instar nymphs to uninfested plants when the population density on the plants on which they were produced became too high, through introduction with horse manure, by migration from small plots, and from reservoirs of infestation on *Chenopodium* sp. and other types of beet.

112 Gordon S. C. and C. E. Taylor. 1976. Some aspects of the biology of the raspberry leaf and bud mite (*Phyllocoptes* (*Eriophyes*) *gracilis* Nal.) in Scotland. Hort. Sci., 51:501-508.

Phyllocoptes gracilis is widespread on cultivated and wild raspberries. However, feeding damage to leaves and fruits is usually observed only in raspberries grown in sheltered situations, where mites tend to aggregate.

113 Graham, H. M. and O. T. Robertson. 1970. Host plants of *Heliothis virescens* and *H. zea* (Lepidoptera: Noctuidae) in the lower Rio Grande Valley, Texas. Ann. Entomol. Soc. Am., 63(5):1261-1265.

Plants of the lower Rio Grande Valley, Texas, were surveyed for eggs and larvae of *H. virescens* (F.) and *H. zea* (Boddie). The earliest plants to harbor the two species were a wild tobacco (*Nicotiana repanda*) and lucerne. During the crop growing season, *H. virescens* was most abundant on tomato and cotton. Primary host plants of *H. virescens* in addition to those already mentioned were okra and *Verbena* sp. Secondary hosts were yellow straight-neck squash, *Medicago hispida* Gaertn., *Helianthus annuus* L., *Passiflora foetida*, *Abutilon* sp., and *Wissadula holosericea* (Scheele) Garcke. Primary host plants of *H. zea* were the same as those of *H. virescens* with the exception of *Verbena* sp. In addition to these were lettuce, bell peppers, grain sorghum, and corn. Secondary hosts were yellow straight-neck squash, string beans, blackeyed peas, *Medicago hispida* Gaertn., *Helianthus annuus* L., and *Passiflora foetida* L.

114 Granados, R. Y. 1972. The role of wild hosts on the population dynamics of the sorghum shoot fly in Thailand. *In:* Jotwani, M. G. and W. R. Young (Eds.). Control of sorghum shoot fly. New Delhi, Oxford, and IBH Pub. Co.

Three grasses, *Digitaria adscendens*, *Brachiaria reptans*, and *Eleusine indica*, were tested in the land as possible alternative food plants of *Atherigona soccata* Rond. Adults were recovered only from *B. reptans*, which according to the records obtained is the least preferred by the fly. *E. indica* was preferred to sorghum. Larvae seemed to need more than one plant to complete their development; thus, small populations may persist on wild food plants in the absence of sorghum. A species other than *A. soccata* was found on *D. adscendens*.

115 Grigorov. S. 1967. A contribution to the study of the biology of aphids of the genus *Dysaphis* on apple and their control. Gradihar. lozar. Nauka, 4(6):33-43.

In studies in 1962-66 in Bulgaria on aphids infesting apple, two species were found, *Anuraphis* (*Dysaphis*) *devecta* (Wlk.) and *Anuraphis plantaginea* (Pass.) (*mali* (Ferr.)). *A. plantaginea* had as its primary food plant apple and as its secondary food plants species of *Plantago*.

116 Grigorov. S. 1977. Study on the biology of the sugar beet root aphid *Pemphigus fusciornis* Koch (Homoptera, Aphididae). Rasteniev''dni Nauki (1977) 14:120-128 (Bg, ru, en, 16 ref.). V. Kolarov Higher Institute of Agriculture, Plovdiv, Bulgaria.

Studies in Bulgaria in 1969-75 showed that *P. fusciornis* (Koch) fed on the roots of sugarbeet, *Chenopodium album*, *Atriplex* sp. and, very rarely, on *Amaranthus* sp. Nymphs cannot survive on weed-free land that is not planted to sugarbeet.

117 Grigorov, S. 1968. The beet root aphid--a dangerous pest of beet. Rastit. Zasht., 16(5):20-22.

Pemphigus fusicornis (Koch) was noted in Bulgaria for the first time in 1963 in the Kyustendil district on the roots of *Chenopodium album*. It was subsequently found there and in other districts on sugarbeet. Its bionomics and control are reviewed from the literature.

118 Gromadzka, J. 1970. The occurrence of leafhoppers (Homoptera, Auchenorrhyncha) on rye grown near shelterbelts. Ekologia Polska, 18(13):291-306.

Surveys of Auchenorrhyncha on winter rye and on the wild herbaceous plants in adjacent shelterbelts or waste ground were carried out in the Koscian district of Poland in May-August 1967. The range of species taken was greatest in fields containing the largest number of weeds. The following weeds were found: *Apera spicaventi, Scleranthus annuus, Polygonum convolvulus, Viola arvensis,* and *Centaurea cyanus*. The shelterbelts were composed of *Quercus* sp., *Betula* sp., and *Populus tremula*.

119 Guagliumi, P., E. J. Marques, and A. F. Mendonca Filho. 1969. The froghopper *A. selecta,* a new pest of sugar cane and pastures in northeastern Brazil. Brazilian Soc. of Entomol. Summaries of the 2nd Annual Meeting, Recife, Pernambuco, Brazil, 1-6 December, 1969, pp. 87-88.

Nymphs and adults of *Aeneolamia selecta* (Wlk.) have been observed in Pernambuco, Alagoas, Paraiba, and Bahia on sugarcane, pangola-grass (*Digitaria decumbens*), and other species of Graminaceae, both cultivated and wild, the damage being more severe on forage grasses than on sugarcane.

120 Guenchev, N. 1968. An ecological study of *Agrotis segetum* Schiffi (Lepidoptera, Noctuidae). [In Bulgarian.] Rast Vud Nauki, 5(4):127-137.

Studies were made in 1965-66 near Sofia in Bulgaria on the food plants lucerne, *Sonchus arvensis,* cabbage, onion, clover (*Trifolium repens*), tomato, *Capsicum mexicanum,* and *Amaranthus retroflexus* of the noctuid *A. segetum*.

121 Guenchev, N. 1971. Noctuids--dangerous pests of plants. The winter Noctuid. Rastilelna Zashchita, 19(6):11:13.

This further paper on noctuid pests of crops in Bulgaria deals with *Agrotis segetum* (Schiff.), which is known to feed on 26 cultivated and 16 wild plant species. The most effective cultural procedure for reducing populations was the eradication of weeds which constitute the basic food plants.

122 Habibi, J. 1975. The cotton white fly *Bemisia tabaci* Gen. Bioecology and methods of control. Entomologie et Phytopathologie Appliquees, No. 38, pp. 13-36.

Bemisia tabaci (Gennadus) has been observed since 1955 in all cotton growing areas of southern and central Iran. Large populations reduced the quantity and quality of cotton yield by reducing the moisture and nitrogen content of the plants and exuding large quantities of honeydew. The late instar larvae and pupae overwintered under the leaves of weeds that remained green in the winter, such as *Convolvulus* and *Althaea* spp. The adults emerged in spring when the mean temperature reached 12° C and fed on the leaves of weeds and cucurbits, but the preferred food plant during the hot summer was melon, which had thick

juicy leaves. When the leaves of melon wilted at the end of August, *B. tabaci* migrated to cotton fields. Decreasing temperatures and increasing humidity favored the rapid build-up of large populations in a short time.

123 Hagel, G. T., B. J. Landis, and M. C. Ahrens. 1973. Aster leafhopper (*Macrosteles fascifrons:* Hem., Hom., Cicodellidae): source of infestation, host plant preference, and dispersal. J. Econ. Entomol, 66(4):877-882.

The local movement and host plants of *M. fascifrons* were studied for 3 years in eastern Washington, by light trap surveys and sweeping. The data indicate that the species did not migrate from remote breeding areas, but populations arose each year from overwintering eggs laid in grain, clovers (red, ladino, and alsike), and grasses, and dispersed to vegetable crops such as carrots and potatoes when the grain and clovers matured or when they were unsuitable as food. *M. fascifrons* returned to fall planted grains and weed hosts in late summer for oviposition of overwintering eggs. Pastures with mixtures of alsike or ladino clover with pasture grasses were the most important breeding areas for the aster leafhopper. These were followed in order of importance by ladino or alsike clover grown for seed, red clover for seed, barley, wheat, sweet corn, oats, carrot, lawn grasses, rye, field corn, *Erigeron* spp., *Ambrosia* sp., sugarbeet, bromegrass, several unidentified perennial grasses, alfalfa, *Taraxacum officinale, Lactuca canadensis* L., *Sisymbrium altissimum* L., and *Chenopodium album* L.

124 Hammad, S. M. and A. M. Raafat. 1973. The biology of the painted lady butterfly, *Vanessa* (*Pyrameis*) *cardui* L. (Lepidoptera: Nymphalidae). Bulletin de la Societe Entomologique d'Egypte, 56:15-20.

Eight generations of *Cynthia* (*Vanessa*) *cardui* (L.) were reared at room temperature in the laboratory in Egypt between early March 1965 and late February 1966. Details are given of the duration of the different stages on various food plants. The larvae were reared on mallow in the first to fourth and in the eighth generation, on artichoke (*Cynara*) in the fifth and sixth, and on thistle, mallow, nettle, or clover in the seventh. Larvae reared on nettle produced the heaviest pupae followed in decreasing order by those reared on artichoke, mallow, lupin, and thistle; larvae reared on clover produced the lightest pupae.

125 Harding, J. A. 1976. *Heliothis* spp. Lep., Noctuidae: Seasonal occurrence, hosts, and host importance in the Lower Rio Grande Valley. Environ. Entomol., 5(4):666-668.

A study was conducted in the Lower Rio Grande Valley of Texas from 1969 to 1973 to help define the population dynamics of *Heliothis zea* and *Heliothis virescens*. A total of 39,277 eggs and 23,396 larvae of Lepidoptera were collected from 95,241 individual plants of weed species in 12,780 row feet of cultivated crops. Budworms were found on more species of plants than bollworms. Corn, cotton, grain sorghum, lettuce, soybean, and tomatoes were the most suitable cultivated hosts of bollworm. *Helianthus* spp. were its main wild host, while husk tomato and *Passiflora* sp. were suitable hosts.

126 Harding, J. A. 1976. Heliothis spp.: parasitism and parasites plus host plants and parasites of the beet armyworm, diamondback moth and two tortricids in the Lower Rio Grande Valley of Texas. Environ. Entomol., 5(4):669-671.

Larvae of the beet armyworm *Spodoptera exigua* (Hb.) were found on six cultivated and five wild hosts. Hosts were: *Amaranthus* spp., broccoli, Brussels

sprouts, cabbage, cauliflower, *Chenopodium* spp., *Helianthus* spp., *Lactuca* sp., *Lepidium* spp., *Nicotiana* sp., *Parthenium* sp., *Rumex* sp., *Solanum* spp., and tomatoes. The diamondback moth *Plutella xylostella* (Linn.) was found on five cultivated and nine wild hosts in a 4-year study. Hosts were: *Amaranthus* spp., bell peppers, *Chenopodium* spp., cotton, grain sorghum, maize, *Parthenium* sp., *Portulaca* spp., soybeans, *Tidestromia* sp., and tomatoes. Two species of Tortricidae, *Platynota rostrana* (Wlk.) and *Platynota flavedana* (Clem.), were found on cotton and four wild plants. Hosts were cotton and *Passiflora* sp.

127 Hatchett, J. H., D. M. Daugherty, J. C. Robbins, R. M. Barry, and E. C. Houser. 1975. Biology in Missouri of *Dectus texanus*, a new pest of soybean. Ann. Entomol. Soc. Am., 68(2):209-213.

Dectus texanus Lec., a Lamiine Cerambycid associated with *Ambrosia* spp., and a new pest of soybean in Missouri, was found to have one generation a year and to overwinter as a full-fed or partly grown larva within the lower portion of the soybean stem.

128 Heathcote, G. D., R. A. Dunning, and M. D. Wolfe. 1965. Aphids on sugar beets and some weeds in England and notes on weeds as a source. Pl. Path., 14(1): 1-10. Bibl. 24.

A survey was made in various sugarbeet areas of England in 1960-62 to determine which aphid species invaded and developed on sugarbeet root crops in spring and early summer and which of these species overwintered on weeds common around sugarbeet fields. The most frequent aphid species found were *Macrosiphum sloanifolii, Myzus persicae, Myzus ascalonicus, Aulacorthum solani,* and *Aphis fabae. Rhopalosiphoninus staphylae* was not found. Samples of weeds which overwinter with a considerable amount of foliage were collected during March to May of 1958-60 and 1963 from sites adjacent to previous sugarbeet crops. Nearly 80% of the samples collected were of *Stellaria media, Senecio vulgaris,* and *Plantago lanceolata* or *Plantago major,* all of which have been shown to be hosts of beet yellow virus. An average of 36% of the samples were infested with aphids. *Myzus ascalonicus* was found on more samples than any other species, followed by *M. persicae, M. solanifolii,* and *A. solani.* Aphids which were transferred from these weed samples were able to infect beet seedlings with virus yellows. Wild beet plants were thought to be only of local importance as sources of beet yellows. Only a small number of weeds of arable crops appeared to be possible sources of viruliferous aphids in spring, although the numbers of weed plants involved could nevertheless be very high. *A. fabae* was not collected from weed samples. The following weeds were infested with beet aphids: *Aethusa cynapium* L. infested by *M. ascalonicus; Capsella bursa-pastoris* L. infested by *M. ascalonicus; Galium aparine* L. infested by *M. solanifolii; Lepidium smithii* Hook infested by *M. persicae* and *M. ascalonicus; Malva* spp. infested by *M. persicae, M. ascalonicus, A. solani,* and *M. solanifolii; Melandrium album* Mill. infested by *M. persicae, M. ascalonicus,* and *A. solani; Ranunculus ficeria* L. infested by *M. ascalonicus; Ranunculus repens* L. infested by *M. ascalonicus; Rumex* spp. infested by *M. persicae, M. ascalonicus,* and *M. solanifolii; Senecio jacobaea* L. infested by *M. ascalonicus; Taraxacum officinale* Agg. infested by *M. persicae* and *M. ascalonicus;* and *Veronica hederaefolia* L. infested by *M. persicae* and *M. ascalonicus.*

129 Hokyo, N., A. Otake, and T. Okada. 1977. Species composition of *Nephotettix* (Hemiptera: Cicadellidae) in West Malaysia and Indonesia. Applied Entomol. and Zool., 12(1):83-85.

A survey of delphacid and cicadellid species present on rice and graminaceous weeds was carried out in January-March 1976 in West Malaysia (Province Wellesley and the Kedah-Perlis coastal plain) and in Indonesia (Java, Bali, and Lampung in Sumatra). Among some 25 cicadellid species collected, *Nephotettix* spp. were the most abundant at most sites, and *Nephotettix nigropictus* (Stal) and *Nephotettix virescens* (Dist.) were the most numerous in the rice fields. The former outnumbered the latter by 2:1 in West Malaysia and 7-14:1 in Indonesia; the ratio in nurseries reached up to 25:1. *N. virescens* was not found on graminaceous weeds in Indonesia. Weeds seemed the main habitat of *Nephotettix parvus* Ishihara and Kawase and *Nephotettix malayanus* Ishihara and Kawase; these were not found in Indonesia. Fewer *Nephotettix* were swept from the IR 26 variety than from Petila and local varieties. The generally low populations of *N. virescens*, a highly efficient vector of the virus causing tungro disease, and of *N. nigropictus* (also a vector) may partially explain why outbreaks of tungro disease are not a problem in the areas surveyed.

130 Homonnay, F. 1978. Biology and development of the cockchafer (*Anoxia pilosa* F.) in Hungary. A pusztaicserebogar (*Anoxia pilosa* F.) eletomodja es fejlodese Magyarorszagon. Noveyvedelmi Kutato Intezet Evkonyve (1976, publ. 1977), 14, 7-34 (Hu. en. ru. 18 ref. 12 fig.). Research Institute for Plant Protection, Budapest, Hungary.

An account is given of studies carried out in the field and laboratory in Hungary on the biology of *Anoxia pilosa* (F.), the larvae of which are pests of orchards, vineyards, meadows, pastures, and various field crops (especially where weeds are abundant) in sandy areas. The food plants, distribution, and descriptions of the development stages and processes are given.

131 Howe, W. L. and A. M. Rhodes. 1973. Host relationships of the squash vine borer *Melittia cucurbitae* with species of *Cucurbita*. Ann. Entomol. Soc. Am., 66(2):266-269.

Larvae of *M. cucurbitae* (Harr.), an Aegeriid that is apparently restricted to plants of the genus *Cucurbita*, can complete their growth only on certain wild and domesticated species of this genus when grown under Illinois conditions. They bore in the vines and roots. Among the domesticated species (all of which attracted oviposition), cultivars of *Cucurbita maxima* (squash) and *Cucurbita pepo* (pumpkin) were highly suitable food plants and favored over *Cucurbita mixta* and *Cucurbita ficifolia*, which were intermediate but did not permit larval maturation. Cultivars of *Cucurbita moschata* were the least satisfactory of the five cultivated species. With cultivars of this species there was little or no larval development, and larval boring occurred only into the petiole. The most preferred wild species were *Cucurbita andreana* and *Cucurbita texana* (also designated as feral species), which were as suitable as larval food plants as the closely related cultivated species, *C. maxima* and *C. pepo*. Less desirable and more distantly related wild species that attracted some oviposition and permitted complete larval development were *Cucurbita okeechobeensis* and *Cucurbita ecuadorensis*. Mesophytic wild species that attracted little or no oviposition and were unsatisfactory for larval development were *Cucurbita lundelliana*, *Cucurbita sororia*, and *Cucurbita gracilior*. Xerophytic wild species, *Cucurbita foetidissima*, *Cucurbita perdatifolia*, and *Cucurbita palmata* did not permit either oviposition or larval feeding.

132 Ibrahim, M. M. 1969. Observations on the nutritional ecology of *Pyrgomorpha conica* Ol. (Orthoptera: Pyrgomorphidae). Bulletin de la Societe Entomologique d'Egypte, 52:229-233.

Studies were conducted in Egypt to determine whether the increased availability of certain food plants might result in outbreaks of hitherto economically unimportant grasshoppers. Investigations on *Pyrgomorpha conica* (Ol.), which is abundant both on uncultivated and on cultivated land, were conducted to determine its ability to develop, survive, and reproduce when its diet is restricted to a single food plant. Of 14 plant species used in the study, only 8 proved suitable for rearing. Adult fecundity was highest on broad beans (*Vicia faba*); moderate on fenugreek (*Trigonella foenum-graecum*), chickpeas (*Cicer arietinum*), clover (*Trifolium alexandrinum*), and *Portulaca oleracea;* and lowest on lupin (*Lupinus termis*), flax (*Linum usitatissimum*), and cotton. Adults survived longest on lupin. The other six plant species tested were maize, lentil (*Lens esculenta*), wheat, barley, *Cynodon dactylon,* and *Imperata cylindrica,* the last two being the dominant wild species in the breeding sites of *Pyrgomorpha conica.* This suggests that the grasshopper may move back and forth between breeding sites and cultivated fields.

133 Inaizumi, M. 1970. Primary host plants for *Aphis gossypii* Glover, and its landing on secondary host plants. Jap. J. Appl. Ent. Zool., 14(1):29-38.

Aphis gossypii Glov. is a serious pest of many vegetable crops, including potatoes, and flowering plants in Japan and is an important vector of many plant viruses. *Clerodendron trichotomum, Callicarpa japonica,* and *Hibiscus syriacus* have been recorded as primary winter food plants of *A. gossypii* in Japan, but the investigations showed that the aphids on the *C. trichotomum* were *A. clerodendri* Mats., those on the *C. japonica* were *Aphis* sp., and those on *H. syriacus* were *A. gossypii.* However, *Celestrus orbiculatus, Rhamnus japonica,* and *Rubia cordifolia* var. *mungista* were found to be hitherto unrecorded primary winter food plants of the aphid. It was also found that viviparous females could overwinter on *Veronica persica, Veronica didymavor, Veronica lilicina, Veronica arvensis, Capsella bursa-pastoris, Althaea rosea, Chrysanthemum morifolium* var. *sinense, Fragaria chilensis* var. *ananassa, Plantago asiatica,* and *Symphytum officinale.* Alate viviparae appeared late in April on these plants and during early May on the primary food plants on which the eggs had overwintered. In early or mid-May, the alate viviparae migrate to potato, vetch, and other plants, and their progeny constitute the major source of secondary colonization. The populations developing in June move to eggplant (*Solanum melongena*) and other vegetable crops, especially cucurbits. It is thought that the populations that colonize potatoes are most likely to have originated on *Veronica* spp. or *H. syriacus.*

134 Iqbal, M. and S. A. Aziz. 1976. Food preference of *Spathosternum prasiniferum* Walker (Orthoptera: Acridoidea). Indian Journal of Entomol. (1975, publ. 1976), 37(1):51-56 (En, 20 ref., 4 fig.). Zoology Department, Aligarh Muslim University, Uttar Pradesh, India.

Laboratory and field tests were carried out in Uttar Pradesh, India, during 1969 on the preference of *S. prasiniferum* (Wlk.) for 12 different species of food plants. First to fourth-instar nymphs preferred the weeds *Echinochloa colonum, Setaria verticillata, Cynodon dactylon, Hemarthria compressa, Cyperus rotundus,* and *Sorghum halepense,* while fifth and sixth-instar nymphs and adults preferred crop plants such as maize, sorghum, pearl millet (*Pennisetum americanum (typhoides)*), rice, wheat, and barley. The acridid fed only on plants favorable for its development, the preference changing with age. Removal of weeds from breeding sites adversely affects the grasshopper population.

135 Ivannikov, A. I. 1969. Russian Knapweed--a harbourer of a polyphagous miner. Zashch. Rast., 14(2),50.

Centaurea repens acts as a host to the leaf miner *Phytomyza atricarnis*, a polyphagous insect pest of crops in the Ala-Tau mountains.

136 Jacobson, L. A. 1969. Biology of *Euxoa tristicula* in the field and laboratory. J. Econ. Entomol., 62(5):1053-1054.

A severe outbreak of *E. tristicula* (Morr.) occurred on sugarbeet in Alberta in 1967, and laboratory and field investigations on the bionomics of the noctuid were carried out in 1967-68. The larvae fed on weeds. During April and May 1968, larvae of *E. tristicula* were found in alfalfa (*Medicago sativa*) fields and on one occasion in a field of flax that was harvested late in 1967. In the laboratory, hatched larvae fed readily on leaves of *Taraxacum officinale*, *Melilotus* sp., or alfalfa.

137 Jacques, R. L., Jr. and D. C. Peters. 1971. Biology of *Systena frontalis*, with special reference to corn. J. Econ. Entomol., 64(1):135-138.

A survey was carried out in 47 counties in northwestern Iowa in 1968 to determine the pest status of *S. frontalis* (F.) on maize. Its major food plant was *Polygonum pennsylvanicum*, while *Amaranthus retroflexus*, *Helianthus annuus*, *Setaria faberii*, *Apocynum cannabinum*, *Abutilon theophrasti*, and *Cirsium arvense* were recorded as food plants for the first time. It was concluded that the damage caused to maize by the flea beetle was small in comparison with that caused by *Diabrotica longicornis* (Say) in the area.

138 Jadot, R. and G. Roland. 1971. Observations on the movement of aphids from labelled weeds in a beet field. Observations sur les deplacements des aphides a partir des plantes adventices marquees dans un champ de betteraves. Mededelingen van de Faculteit Landbouwwetenschappen Rijksuniversiteit Gent, 36(3):940-944.

Studies to trace the movement of certain aphid vectors of beet yellows virus by means of radioactive phosphorus demonstrated that the intermediate host plants *Senecio vulgaris* and *Veronica persica* were preferred to *Stellaria media*. The aphids found on each weed were: on *V. persica: Myzus persicae* and *Aphis fabae;* on *S. vulgaris: A. fabae*, *Aulacorthum solani*, *Macrosiphum euphorbiae*, and *M. persicae;* on *S. media: M. persicae*, *M. euphorbiae*, and *A. fabae*.

139 Jalamkar, M. R., M. N. Borle, and S. N. Bodhade. 1974. New record of alternative host plants of red cotton bug, *Dysdercus cingulatus* Fab. Current Science, 43:631-632.

Dysdercus cingulatus is considered to be one of the major pests of cotton and is known to attack many other cultivated plants. Nymphs of red cotton bug were observed feeding on *Chrozophora rottleri* and *Trichodesma amplexicaule* in fields at Akola in the Indian State of Maharashtra. It was concluded that these two weeds were important alternative food plants for adults during winter.

140 Jalamkar, M. R., M. N. Borle, and S. N. Bodhade. 1975. Records of alternate host plants of the red cotton bug. Entomologists' Newsletter, 5(6/7):33.

Nymphs of the red cotton bug (*Dysdercus cingulatus* (F.)) were found feeding on the weed plants *Chrozophora rottleri* and *Trichodesma amplexicaule* in fields at

Akola in the Indian State of Maharashtra. In laboratory observations of *Dysdercus cingulatus* on these plants, the bugs continued feeding and moulting; most of them survived the winter. It was concluded that these weeds were alternative food plants for adults during the winter.

141 Kabasinskaite, M. and P. Zajanckavskas. 1970. The apple leaf skeletonizer (*Simaethis pariana* Cl.) in the orchards of Lithuanian SSR. Obeline lapsukine kandis (*Simaethis pariana* Cl.) Lietuvos SSR soduosd. Acta Entomologica Lituanica, 1:83-89.

Investigations in 1967-68 showed that the percentage of leaves of fruit trees damaged by *Eutromula* (*Simaethis*) *pariana* ranged from 19.6 to 45%. Cocoons of this moth were found on *Pimpinella saxifraga, Agropyron repens, Sonchus oleraceus,* and red clover (*Trifolium pratense*), as well as on fruit trees.

142 Kajita, H. 1977. Survival and development of the greenhouse whitefly, *Trialeurodes vaporariorum* (Westwood), on weeds. Japanese J. of Applied Entomol. and Zool., 21(3):159-171 (Ja, 9 ref., 1 fig.). Institute of Biological Control, Faculty of Agriculture, Kyushu University, Fukuoka 812, Japan.

143 Kalode, M. B., C. P. Yadava, and P. Israel. 1969. Reaction of gundhi bug, *Leptocorisa varicornis* Fabricius, to some food plants. Current Science, 38(13):321.

In rearing experiments with *L. acuta* (Thob.) (*varicornis* (F.)) on eight species of Gramineae in India, *Echinochloa colonum* proved able to sustain the nymphs for a week at a survival rate of 15% and the adults for 40 days at a rate of 60%. On rice, the survival rate was 77% after 34 days, which indicated that *E. colonum* was a potential alternative food plant. Destruction of this weed is therefore suggested as a means of controlling *L. acuta.*

144 Kalode, M. B., A. Varmad, C. P. Yadava, and D. Israel. 1971. Feeding reaction of army worm (*Cirphis compta* Moore) larvae fed on some cultivated and wild plants. Indian J. of Agri. Sciences, 41(6):568-576.

The suitability of 13 wild and cultivated monocotyledonous plants as food for the larvae of *Spodoptera* (*Cirphis*) *compta* (Moore), which has recently occurred at Cuttack as a pest of rice, was investigated in the laboratory in 1968-69. The larvae could feed and develop on various plant species in the absence of rice. They included *Cynodon dactylon, Cyperus rotundus, Echinochloa colonum, Eleusine indica, Setaria glauca,* sorghum, and *Zea mays.*

145 Karaloash, Yu. A., Yu. I. Prikhod'ko, V. M. Tkachev, and V. P. Loshitskii. 1970. Three pests of apple. The Tenthredinid *Ametastegia glabrata,* a pest of apples. Zashchita Rastenii, 15(12):41.

Development was completed on weeds in the orchards. To facilitate control, weeds should be eliminated, particularly in summer and autumn.

146 Kas'yanov, A. I. 1971. *Homorocoryphus nitidulus.* Zashchita Rastenii, 16(8): 49.

In the Kuban area of the Soviet Union, white panicles of rice observed in August are the result of feeding by *H. nitidulus* (Scop.) on the ears. The species is found in subtropical parts of the Soviet Union, where it feeds on the

leaves of citrus and tea. To reduce it, the systematic destruction of weeds must be carried out in rice-growing areas.

147 Kas'yanov, A. I. 1970. The cereal aphid on rice crops. Zashchita Rastenii, 15(7):16-17.

Schizaphis (*Toxoptera*) *graminum* (Rond.) caused considerable damage to cereal crops and in some years damaged rice in Soviet Central Asia and the Ukraine. It overwintered in the egg stage on the shoots of winter and wild cereals.

148 Khalifa, A., A. H. Isa, and W. H. Awadallah. 1972. Studies on *Cnephasia* in Egypt. II. Symptoms of infestation (Lepidoptera: Tortricidae). Bull. de la Societe Entomologique d'Egypte, 56:323-331.

In this second part of a series, an account is given of studies on the winter food plants of *Cnephasia pumicana* (Zell) in Egypt, and on the oviposition sites at which the first-instar larvae remain quiescent. During the period of larval activity, virtually all the plants inspected (which included wild and cultivated crucifers, Leguminosae, Graminaceae, and Compositae) were found to be infested. The plants suitable for complete larval and pupal development comprised wheat, barley, and *Avena fatua*. Those on which the larvae were able to complete their development but on which they did not pupate included flax, Egyptian clover (*Trifolium Alexandrinum*), and fenugreek (*Trigonella foenum-graecum*). Those on which only the early instars could develop included broad-bean (*Vicia faba*), cabbage, cauliflower, rape (*Brassica napus*), radish, *Medicago ciliaris*, and *Carduus* spp. Late-instar larvae fed and pupated on *Chrysocoma* sp.

149 Khan, M. Q. and D. V. Murthy. 1956. *Dicanthium annulatum* Stapf.--an important alternate host plant of jowar and sugarcane mites. Indian J. Entomol., 18(2): 198-199.

Oligonychus (*Paratetranychus*) *indicus* (Hirst) is a pest of sorghum sown in October and of sugarcane planted in October to January in the Nizamabad district of Hyderabad state. Sugarcane is also infested by *Schizotetranychus andropogoni* (Hirst). *O. indicus* does not attack the plants until after the end of the southwest monsoon rains. Both mites were found to occur on *Dicanthium annulatum* during the rainy months of June to September. All stages were observed on this grass, even during the heaviest rains, which may indicate that it is the main food plant of the mites.

150 Khan, R. M., S. L. Doval, and H. C. Joshi. 1969. Biology of brown wheat mite, *Petrobia latens* (Muller). Indian J. Entomol., 31(3):258-264.

In 1963-64 *P. latens* was found damaging the leaves, leaf sheaths, and spikes of barley and especially of wheat in both irrigated and unirrigated land in the Indian state of Rajasthan. It was recorded for the first time on four minor food plants, *Citrus* sp., *Convolvulus arvensis*, *Fumaria indica*, and *Chenopodium album*, as well as its main food plants wheat, barley, *Cynodon dactylon*, and *Vicia hirsuta*.

151 Kier Byerly, F. and C. Sosa Moss. 1967. Observations on the overwintering of *Epilachna varivestis* Muls. VI Congress Nacional de Entomologia organizado por la Sociedad Mexicana de Entomologia, 23-26 Octobre de 1967, p. 56.

The overwintering sites of adults of *E. varivestis* have been investigated in the state of Mexico since 1966. Certain ecological niches among wild plants, litter, and soil were found to be used, and the possible reasons for the choice of these sites were studied, together with the precise duration for hibernation.

152 Kilic, A. U. No date. Sunn pest, *Eurygaster integriceps*, in southeastern Turkey. Source: Report, CENTO Scientific Programme (1976, recd. 1978), No. 22, iii + 88 p. 15-20 (En). Regional Plant Protection Research Institute, Diyarbakir, Turkey.

Eurygaster integriceps Put. is one of the most important cereal pests in Turkey, but populations declined in the southeastern part of the country in 1971-76. Information is given on the type and intensity of the damage caused, the biology of the pest (including migration), chemical control, and natural biological control in this region. The greatest damage was caused by the older nymphs and adults attacking the grains, but overwintered adults also caused stem drying. Migration of overwintered adults from the soil or from under low-growing wild plants to cereal fields, grassy pastures, or weedy areas occurred in late March or early April when the temperature reached 18° C. The adults oviposited on cereals or weeds and the new generation of adults emerged in late May and remained until the temperature reached about 33° C in June. They then migrated to aestivation areas, sometimes stopping to feed in fields at high altitudes where the cereals were not yet ripe. Aestivation lasted for about 4 months, after which *E. integriceps* descended to altitudes of 1000-1500 m and remained there to overwinter.

153 Kim, M., H. S. Koh, T. Ichikawa, H. Fukami, and S. Ishii. 1975. Antifeedant of barnyardgrass against the brown planthopper, *Nilaparvata lugens* (Stal) (Homoptera: Delphacidae). Applied Entomol. and Zool., 10:116-122.

Among three species of planthoppers, *N. lugens*, *Laodelphax striatella* (Fall.), and *Sogatella furcifera* (Horv.), nymphs of *N. lugens* could not grow by feeding on barnyardgrass, *Echinochloa crus-galli*, at any leaf stage and died within a few days on this species. However, nymphs of the other two species of planthoppers developed normally to the adult stage both on barnyardgrass and rice.

154 King, T. H. 1968. Occurrence and distribution of diseases and pests of rice and their control in Thailand. Pl. Prot. Bull., FAO, 16(3):41-44.

The most serious weeds of rice on the Central Plain are Cyperaceae, mainly *Cyperus* sp., *Fimbristylis* sp., and *Eleocharis* sp. Leafhoppers (the most important insect pests) have been collected on *Eleusine indica*, *Panicum* sp., *Digitaria* sp., *Cyperus* sp., and wild rice (*Oryza* sp.).

155 Klimanova, N. K. 1971. Leaf miners on rice. Zashchita Rastenii, 16(4):33-34.

Observations in the Maritime Province of the Soviet Far East in 1969 revealed considerable damage to rice by leaf miners, particularly *Hydrellia griseola* (Fall.) and *Agromyza oryzae* (Munakata). *Hydrellia griseola* had up to four generations a year, the first two completing their development mainly on rice, although partly also on wild grasses, while the last two were completed on wild plants. Winter was passed in puparia in the remains of wild grasses bordering the rice fields. *Agromyza oryzae* had up to three generations a year and overwintered in the pupal stage on the surface of the soil, under plant remains, and on the fallen leaves of rice and wild grasses. The first two generations

completed their development on rice and *Zizania* sp., and the third did so almost exclusively on the latter plant.

156 Kolesova, D. A. 1972. The ecology of pear aphids of the genus *Anuraphis* Guercio in the Crimea. Vestnik Zoologii, 3:11-15.

The host plant relationships of four species of *Anuraphis* (*Anuraphis farfarae* Koch, *Anuraphis pyrilaseri* Shap., *Anuraphis subterranea* Wlk., and *Anuraphis catonii* H. R. L.) are described. Two generations occur on pear annually. The progeny of the fundatrices migrate to other host plants, including, respectively, *Tussilago farfara* and *Petasites vulgaris; Laserpitium hispidum, Pastinaca sativa,* and *Heracleum spondylium; Pimpinella saxifraga;* and *Pastinaca sativa. A. farfarae* is represented in the Crimea by two strains, one that makes a return migration in autumn to pear, its spring host, and one that develops parthenogenetically throughout the year on *Tussilago farfara.*

157 Kondakov, N. I. and L. A. Nogina. 1968. The potato moth on hops. Zashch. Rast., 13(6):47.

Hydraecia micacea (Esp.) was observed in the Chuvash Republic of the Soviet Union for the first time in 1963 on hops and had spread to 13 districts by 1965, with the highest numbers in the northeast. Investigations showed that the eggs overwintered in the leaf sheaths of grasses. Clean cultivation and ploughing in of the eggs laid in weeds in autumn, with applications of a dinitro preparation in autumn and spring, destroyed 97-98% of the egg masses.

158 Kontev, Kh. 1973. *Oria musculosa* Hb. Zashchita Rastitelna, 21(6):32-36.

Oria musculosa (Hb.) damages wheat, barley, oats, sorghum, and millet; its food plants also include species of *Agropyron, Bromus, Cynodon,* and *Setaria.*

159 Kraemer, P. 1966. Two wild host plants for the bollworm in Honduras. J. Econ. Entomol., 59(6):1531.

Malvastrum spicatum and *Melanthera hastata,* which are abundant as weeds near cotton fields in Olancho Province, Honduras, were found to be infested by *Heliothis zea,* the larvae feeding on the leaves of the former and on the flowers of the latter. Infestation on the weeds was as heavy as on the cotton. The weeds were found to be temporary host plants of *H. zea.*

160 Laitinen, T. and M. Raatikainen. 1975. Seasonal aspects of beetle fauna occurring in oats in western-Finland. Annales Agriculturae Fenniae, 14:203-209.

A list is given of 83 species of Coleoptera which were taken as adults in fields of oats in western Finland in 1959-1962 with the aid of nets. Of the species found, only *Chaetocnema hortensis* (Geoffr.), *Phyllotreta vittula* (Redt.), and Elaterids (of which *Gtenicera (Corymbites) incana* (Gylh.) was the most common) are considered to be potentially injurious to cereals. *Meligethes aeneus* (F.) (one of the species found most frequently), *Phyllotreta undulata* Kutsch, *Phyllotreta vittata* (F.), and *Ceutorhynchus assimilis* (Payk.), which develop on crucifers, and *Chaetocnema concinna* (Marsham), which develops primarily on polygonaceous plants, are considered to be beneficial on oat fields because they feed on weeds, although they may be injurious to other crops. However, if the weeds in oat fields are not treated with herbicides, they may harbor the injurious species.

161 Lal, L. and S. P. Mukharji. 1975. Incidence of rice gundhi bug on certain medicinal plants at Varanasi. Science and Culture, 41(11):560-561.

Leptocorisa acuta (Thnb.) (*varicornis* (F.)), a major pest of rice, is known in India to overwinter on *Blumea lacera* and afterwards feed on the new leaves of mango, then feed on a succession of wild and cultivated plants, mostly Gramineae. It is suggested that *L. acuta* infests *Grewia hirsuta* in June and July, passes to rice, and afterwards migrates to *Barleria prionitis* at the beginning of November, and finally to *Blumea lacera* for hibernation.

162 Lal, O. P. 1977. On the overwintering of the leaf-beetles *Altica caerulescens* Baly and *Macrima armata* Baly (Col., Chrysomelidae) in the Kulu Valley, North India. Anzeiger fur Schadlingskunde, Pflanzenschutz, Umweltschutz, 50(2):28-29.

Adults of *A. caerulescens* were found overwintering under the bark of willow (*Salix alba*) and to a lesser extent on *Alnus nitida* during a survey in 1972-74 in the Kulu Valley. *A. caerulescens* is a pest of egg-plant (brinjal), tomato, spinach, strawberry, and weeds of the genera *Rumex* and *Impatiens*.

163 Landis, B. J., W. E. Peay, and L. Fox. 1970. Biology of *Cosmobaris americana* Casey, a weevil attacking sugar beets. J. Econ. Entomol., 63(1):38-41.

Field studies were carried out in the northwestern United States in 1966-68 on the biology of *C. americana*, which attacks sugarbeet and several weeds (chiefly Amaranthaceae and Compositae). Full-fed larvae overwintered in old feeding galleries in weeds and only rarely in sugarbeets. It is thought that the weed *Kochia americana*, which has become established along railway lines in eastern Washington and northeastern Oregon, is mainly responsible for the spread of the weevil in the northwestern United States. R. E. Warner listed the following additional host records attached to specimens in the U. S. National Museum: alfalfa, soybeans, swiss chard, *Amaranthus retroflexus, Atriplex confertifolia, Atriplex hastata, Atriplex hortensis, Atriplex rosea, Bassia hyssopifolia, Chenopodium album, Halogeton glomeratus, Helianthus tuberosus, Kochia americana, Salsola kali* var. *tenuifolia*, and *Typha latifolia*.

164 Landis, B. J., D. M. Powell, and L. Fox. 1972. Overwintering and winter dispersal of the potato aphid (*Macrosiphum euphorbiae:* Hem., Hom., Aphididae) in eastern Washington. Environ. Entomol., 1:68-71.

In most northern regions, *M. euphorbiae* overwinters only in the egg stage on roses (*Rosa*). However, in eastern Washington, the species also overwinters as viviparae on winter-hardy weeds and crops. The dispersal of winged forms in November and January and the establishment of colonies on fall-germinated weeds are of particular interest. Herbaceous plants on which *M. euphorbiae* was found between 1948 and 1969 in eastern Washington were: *Amsinckia intermedia, Beta vulgaris* var. *circla, Brassica nigra, Capsella bursa-pastoris, Chenopodium album, Descurainia sophia, Erigeron canadensis, Gladiolus* sp., *Lactuca pulchella, Lamium amplexicaule, Lepidium perfoliatum, Lycium halimifolium, Malva rotundifolia, Rumex crispus, Sisymbrium altissimum*, and *Solanum tuberosum* (potato cull pile).

165 Laster, M. L., D. F. Martin, and S. D. Pair. 1976. Burcucumber: a new host for the tobacco budworm. J. Econ. Entomol., 69(2):192-194.

Burcucumber, *Sicyos angulata,* plants were first observed at Stoneville, Miss., in 1972. *Heliothis virescens* larvae were collected from burcucumber plants during 1973, 1974, and 1975. This is an unreported host of *H. virescens* in Mississippi. It grows profusely in well-drained, protected, and undisturbed areas and may prove to be a potential host for building up early season and overwintering populations of this insect pest.

166 Leroi, B. 1976. Biocoenotic relations of the celery fly, *Philophylla heraclei* L. (Diptera, Tephritidae) the necessity for complementary plants for populations living on celery. Relations biocoenotiques de la mouche du celeri, *Philophylla heraclei* L. (Diptera, Tephritidae): necessite de vegetaux complementaires pour les populations vivant sur celeri. 443-454 (Fr, en, 16 ref., 1 fig.). Institut Biocoenotique Experimentale des Agrosystemes, Universite Francois-Rabelais, 37200 Tours, France. Source: Colloques Internationaux du Centre National de la Recherche Scientifique (1977). No. 265, 493 pp. (Bris).

In investigations in and around celery fields in the Tours area of France in 1967-68, most first-generation eggs of *Euleia heraclei* (L.) (*Philophylla heraclei*) were laid on several wild species of Umbelliferae that had their foliage fully developed in April and on which the larvae fed and developed satisfactorily. Celery fields were colonized mainly in autumn by the second generation. Newly emerged adult females were attracted to trees, where they rested, fed on honeydew and nectar, and mated. There was a marked border effect in infestation of celery fields, and only mated females were found in the fields.

167 Leston, D. 1970. The identity and pest potential of *Oxycarenus* spp. (Hem., Lygaeidae) in Ghana. Bull. Ent. Res., 60:285-289.

The distribution, habitat, and cultivated and wild food plants of four species of *Oxycarenus* found in Ghana are given. *Oxycarenus fieberi* is hosted by *Sida acuta* and *Sida rhombifolia,* perennials which grow at isolated margins of cocoa farms, in farmbush, and along pathways. *Oxycarenus hyalinipennis* is hosted by *Abutilon guineense* and *Sida cordifolia,* where it also infests cotton, okra, and kenaf.

168 Lewis, T. 1973. Thrips, their biology, ecology, and economic importance. London, U. K., Academic Press. XV +349 pp.

Interest in thrips has increased in recent years and the author in this book seeks to present them as living animals having relations with other animals and plants and other elements of their environment. The matter is divided into four main sections, divided into chapters. The subject headings of the sections are biology, techniques, ecology, and economic importance (which includes the control of injurious species and a chapter on thrips that prey on other insects or feed on weeds). There are six appendices, an index to the authors cited in the text, and a general index.

169 Liebermann, J., J. C. Espul, and P. S. Mansur. 1971. On *Miogryllus convolutus* (Johannson) in the vineyards of San Carlos, La Consulta, Mendoza (Orth. Gryllomorpha, Grylloidea, Gryllidae, Gryllinae). Idia No. 281:55-61.

Miogryllus convolutus, which occurs in Central and South America as far south as Argentina, has caused serious damage in recent years in vineyards in the region of La Consulta in the Argentine Province of Mendoza by destroying the developing buds in spring. Nothing was known of the bionomics of this Gryllid.

In the laboratory the Gryllid fed on a variety of cultivated and wild plants and appeared to be polyphagous.

170 Lowe, A. D. 1969. A preliminary account of *Macrosiphum miscanthi* Takahashi on grasses and cereals in New Zealand. Entomologist, 4(2):33-35.

Large numbers of *M. miscanthi* infested many wheat crops in the Canterbury area of New Zealand in early summer in 1967 and 1968. During trapping and sampling over the 8 years up to December 1966, it was taken only once on a trap, but in the spring of 1966 it was taken on *Avena* sp., *Triticum* sp., and *Bromus unioloides* at two widely separated places in the South Island and one in the southwest of the North Island. In October 1967, it was found on most species of grasses in Canterbury. Later large numbers occurred on the inflorescences of grasses, wheat, oats, and barley, and as these dried off, on the opening inflorescences of grasses at higher altitudes in Canterbury and on crops in South Canterbury. During the winter of 1968, occasional nymphs were found in clumps of coarse grasses and autumn-sour cereals, single alates were found on chou modlier, and alates with nymphs on apple shoots. Plants on which *M. miscanthi* occurred during the following months included *Galium aparine*.

171 Macci, A. K. and G. H. Munshi. 1972. Carry over of *Nezara viridula* Linn., Pentatomidae, to a new host plant, at Tandojem. Agriculture Pakistan, 22(2):183.

In Tandojam, Pakistan, adults and nymphs of *N. viridula*, a pest of potato, were found for the first time feeding on *Cleome viscosa*. The Pentatomid exists on this plant, which is a weed of medicinal value, in the offseason and continues its normal and regular life cycle on potato and pulses in their growing season.

172 Maceljski, M. and I. Balarin. 1972. Contribution to knowledge of polyphagy and its significance in *Autographa gamma* L. Acta Entomol. Jugoslav, 8(1-2): 39-54.

On the basis of literature records and new observations, a list is presented of about 225 species of plants (51 families) serving as food plants for larvae of *A. gamma*. Experimental rearings, using 122 species, established five groupings according to feeding intensity. *Pinus* (Pinaceae) was shown to be unsuitable as a food plant, contrary to previous reports. Development was good on certain common weeds: *Convolvulus sepium* (Convolvulaceae), *Chenopodium album* (Chenopodiaceae), *Chenopodium polyspermum*, *Sonchus arvensis* (Compositae), *Taraxacum officinale* (Compositae), and *Plantago media* (Plantaginaceae), especially when a mixture was available. On such plants, mortality was mostly due to nuclear polyhedrosis. The importance of weeds for the reproduction and migration of *A. gamma* in nature is emphasized, and the use of herbicides for indirect control of the species is discussed.

173 MacFarlane, J. H. and A. J. Thorsteinson. 1977. Development and survival of the two striped grasshopper, *Melanoplus bivittatus* (Orth., Acrididae), on various Leguminosae food plants including faba beans and weeds. Ann. Entomol. Soc. Am., 70(1):75-80.

The following four weed species were included: *Vicia* spp., *Medicago lupulina*, *Lathyrus venosus*, and *Glycyrrhiza lepidota*. Individual *M. bivittatus* were restricted in diet to a single species or cultivar of Leguminosae, including 13 varieties of *Vicia faba* throughout larval development. Greater than 50% survival of the larvae was observed on *Medicago sativa* and some of the *V. faba* vari-

eties, while three of the varieties currently registered in Canada, Ackerperle, Diana, and Herz Freya, supported low or no survival. Very low survival of the larvae was observed on the wild legumes.

174 Makarov, M. 1968. The lucerne Cerambycid. Rastit. Zasht., 16(2):13-18.

Plagionotus floralis (Pall.), of which only the larvae are injurious, was noted as a pest of lucerne in Bulgaria for the first time in 1928-29. In recent years, the numbers of this Cerambycid have increased and in some places the damage to lucerne has been serious. It had one generation a year and overwintered as larvae in the roots of lucerne. The adults emerged in June and were present in the fields until the end of July, feeding on the flowers of weeds in the families Compositae and Umbelliferae. Observations in late July 1966 showed that there were 10-15 times as many adults in the field verges where weeds were present as in the actual lucerne.

175 Malekghassemi, B. 1969. Biological investigations on the rearing and control of *Pegomya betae* with the help of the auto-annihilation method (sterile-male technique). Biologische Untersuchungen uber die Zucht und Bekampfung der Rubenfliege (*Pegomya betae* Curtis) mit Hilfe der Selbstvernichtungsmethode (Sterile-male-Technik). Bayer landw. Jb., 46(1):3-61.

The author discusses the nomenclature of *Pegomya betae* (Curt.), reviews its food plants and parasites, and gives the results of detailed investigations on its life cycle on beet in the field in Bavaria, including its bionomics under controlled conditions. Females given a choice laid many more eggs on beet and spinach than on *Atriplex hortensis* or *Chenopodium album*.

176 Mammen, K. V. and K. P. Vasudevan Nair. 1977. Outbreak of rice thrips in Kerala. Entomologists' Newsletter, 7(1/2) 3-4 (En). Dept. of Entomology, Agricultural College, Vellayani, Trivandrum, Kerala, India.

Rice planted in the last week of November in the Alleppey and Kottayam districts of Kerala State, India, was severely infested by *Baliothrips biformis* (Bagn.) in 1976. Seedlings 1-6 weeks old were especially badly affected, and infestation in the nursery was frequently carried over to the transplanted crop. When there was no rice crop in the field, *B. biformis* was able to multiply on wild grasses growing around the rice fields.

177 Mamontova, V. A. 1975. The beet root aphid. Zashchita Rastenii, No. 10, 33-35.

Pemphigus fusicornis (Koch), an important pest of sugarbeet, was observed in the Soviet Union for the first time in 1959 and has since spread considerably. It does not require an alternative winter food plant. It has been observed to breed only on beet and wild chenopodiaceous plants. The corresponding species in North America, *Pemphigus populivenae* Fitch (*Betae doane*), overwinters on three species of *Populus* before migrating to beet. *P. fusicornis* requires the production of a special overwintering generation of females, differing morphologically from the summer females, and they overwinter in the soil on roots of beet and chenopodiaceous weeds.

178 Mamontova-Solukha, V. O. and A. F. Hapanova. 1966. The beet root aphid (*Pemphigus fusicornis* Koch, Homoptera, Aphidinae) in the Ukraine. Zakhyst Roslyn, pt. 3, pp. 20-31.

Pemphigus fuscicornis was first detected in the Soviet Union in 1959. Since then it has caused considerable damage to sugarbeet in the Ukraine and in Krasnodar. During the summer, a number of generations of apterous parthenogenetic alienicolae developed on the roots of *Chenopodium* and beet.

179 Manglitz, G. R., H. J. Gorz, and H. J. Stevens, Jr. 1971. Biology of the sweetclover root borer. J. of Econ. Entomol., 64(5):1154-1158.

Walshia miscecolorella (Chamb.) is a species of Lepidopterous root borer found throughout the United States and parts of Canada. Limited observations showed that the distribution of the borer on sweetclover extended northwards from Texas. The larvae infest the crown of sweetclover plants. In the field, the principal food plants of the pest were wild species of Leguminosae but development could also be completed in several species of *Melilotus*. Although red clover (*Trifolium pratense*) and lucerne were grown in close proximity to heavily infested sweetclover, there was no instance of attack. Moths were reared on the following *Melilotus* species: *M. alba, M. hirsuta, M. officinalis, M. polonica, M. suaveolens, M. taurica,* and *M. wolgica*. Its larval stages fed on wild *Lupinus* sp. and *Astragalus* sp.

180 Mani, E. and L. Stalder. 1968. The larva of the dock sawfly, *Ametastegia glabrata,* as a pest in orchards. Schweiz. Z. Obst-U. Weinb, 104:85-87.

The life cycle of the sawfly is briefly described. Control should be achieved by eradicating the host plant, *Rumex obtusifolius,* because of the late migration of the pest to the fruit.

181 Manley, G. V. 1977. A rice feeding buprestid from Malaysia: *Aphanisticus peninsula* Obenb. Pacific Insects, 17(2/3) 265 (En, 1 ref.), 7907 Rustic Forest, San Antonio, Texas.

Aphanisticus peninsula Obenb., a buprestid widely distributed in Southeast Asia and the Pacific region, was observed to feed on the leaves of rice plants under laboratory conditions. In the field, this species was not collected from rice plants but mainly from *Imperata cylindrica,* a very common plant in Malaysia, near rice fields. It appeared to avoid plants growing both in sunny and heavily shaded conditions, which may explain its absence from rice fields. Other insects, notably *Melanitis leda* (L.), are known to feed on both rice and *I. cylindrica,* and it is suggested that the wild plant may serve as a reservoir both of potential rice pests and of natural enemies of rice insects.

182 Markkula, M. and K. Roukka. 1972. Resistance of cereals to the aphids *Rhopalosiphum padi* (L.) and *Macrosiphum avenae* (F.) and fecundity of these aphids on Gramineae, Cyperaceae, and Juncaceae. Annales Agriculturea Fenniae, 11:417-423.

The resistance of several hundreds of varieties and lines of spring wheat, barley, and oats to *R. padi* and *M. avenae* was studied in plot tests in Finland. *R. padi* reproduced on a wider range of plants in families Gramineae, Cyperaceae, and Juncaceae than did *M. avenae*. *Avena fatua* hosted the greatest number of *R. padi,* while *Poa annua* was a superior host of *M. avenae*.

183 Martin, P. B., P. D. Lingren, and G. L. Greene. 1976. Relative abundance and host preferences of cabbage looper, soybean looper, tobacco budworm, and corn earworm on crops grown in northern Florida (USA). Environ. Entomol., 5(5): 878-882.

The relative abundance and host plant preferences of *Trichoplusia ni, Pseudoplusia includens, Heliothis virescens,* and *Heliothis zea* (all Lep., Noctuidae) were studied in field cage and field experiments in northern Florida. Results indicated relatively strong preferences of the test species for certain crops. *T. ni* was more abundant than *P. includens* and showed a strong preference for cabbage and collards over 21 other crops. Soybeans were the preferred host of *P. includens,* but substantial numbers of larvae were found on peanuts and tomatoes in the field. Both species readily oviposited on *Xanthium pennsylvanicum* in the presence of other host plants in a small field cage, and four species of *Plusiinae* were found attacking crops in the field. *H. virescens* was more abundant on tobacco and okra than on other crops in the field, but became abundant on okra only after tobacco was removed from the cropping system. Also, small numbers of *H. virescens* were found on cabbage, collards, peanuts, white clover, and tomatoes. In addition, substantial numbers of eggs and a few larvae were found on tomatoes in field cages. *H. zea* appeared to prefer corn, sorghum, and millet over other crops in the field, but infestations of this species were found on 18 of 21 crops tested. Also, a field cage test indicated that *H. zea* preferred tomatoes over other crops such as bell peppers, bush beans, cabbage, cigar-wrapper tobacco, collards, and soybeans.

184 McDonald, F. J. D. 1971. Life-cycle of the green stinkbug, *Plautia affinia* Dallas (Hem., Pentatomidae). (Het.). J. Austral. Entomol. Soc., 10:271-275.

P. affinia is common on *Salvia spendens* (Labiatae) from early September and is a minor pest of tomatoes (Lycopersicum: Solanaceae) and other vegetables. Mating occurs in early October, nymphs appearing in late October to early November. The adult is the overwintering stage.

185 Meirleire, H. de. 1968. Damage on apples by *Otiorhynchus.* Degats sur pomes d'un otiorrhyngue. Phytoma, 20(210):27,28.

Otiorhynchus impressiventris subsp. *veterator* Uytt., which is widespread on wild plants throughout France and has been known to damage the leaves of pear near Paris, at times is a severe pest of young grafted apple trees growing on the site of old orchards.

186 Meirleire, H. de. 1977. On the cereal noctuid in Champagne. A propos de la noctuelle desmosissons en Champagne. Phytoma, 29(291):20-21 (Fr, 5 fig.).

The biology, injuriousness, and chemical control of *Agrotis segetum* (Schiff.) (*Scotia segetum*) are described, mainly from observations in the Ardennes department of northern France in 1976, when an outbreak occurred on sugarbeet and caused extensive damage. Endive, carrot, lucerne, lettuce, and potato were also affected, and many larvae occurred on maize, tobacco, grapevine, and with special reference to the drought conditons that occurred then. In March 1977, considerable numbers of larvae were observed in the soil where wheat was grown after sugarbeet.

187 Meirleire, H. de. 1971. Two Chrysomelid pests of cereals. Deux chrysomelides parasites des cereales. Phytoma, 23(226):33-34.

Notes are given on *Oulema (Lema) melanopa* (L.) and *Oulema* (L.) *lichenis* (Veet.), which feed on the leaves of cereal crops and wild grasses in the Champagne region of France.

188 Metcalfe, J. R. 1968. Studies on the biology of the sugarcane pest *Saccharosydne saccharivora* (Westw.) (Hom., Delphacidae). Bull. Ent. Res., 59(3):393-408.

Laboratory studies and field observations were made in Jamaica and British Honduras on the food plants, life history, and habits of *S. saccharivora*, a major pest of sugarcane. Its orginal food plants are shown to have been two grasses, *Andropogon glomeratus* and *Andropogon bicornis*.

189 Mikhailova, N. A. 1970. The biology of the cereal Mirid in Bashkiria. Zashchita Rastenii, 15(8):43.

Laboratory and field investigations were made in Bashkiria (Soviet Union) in 1965-69 on the biology of *Trigonotylus ruficornis* (Geoffr.). The mirid is a pest particularly of spring wheat, as well as of oats, barley, sorghum, and maize. In Bashkiria it had two generations a year, overwintering in the egg stage on wild and cultivated grasses, from which it subsequently migrated to cereal crops.

190 Minoranskii, V. A. 1968. The garden earwig. Zashchita Rastenii, 13(9):43.

Forficula tomis (Kol.) is of common occurrence in the European part of the Soviet Union, Central Asia, western Siberia, and the Caucasus, causing considerable damage in the south to potato, sunflower (*Helianthus annuus*), cabbage, tomatoes, cucumber, melon, etc. It overwinters as a full-fed larva under cover or in the soil in turfy areas with weed cover. Agrotechnical measures including weed eradication and ploughing are the principal means of control.

191 Mitchell, B. L. 1969. The potato tuber moth or tobacco leaf miner *Phthorimaea operculella* (Zeller). Its biology and control. Rhodesia Agri. J., 66(3):54-57.

Phthorimaea operculella is an important pest of potato and tobacco in Rhodesia, where it also breeds on other solanaceous plants, notably the wild *Nicandra physaloides*.

192 Mitic-Muzina, N. 1969. Plant lice pests of corn: *Byrsocripta gallarum* Gmel. and *Anoecia corni* Fab. (Homoptera, Aphidoidea). Contemporary Agriculture (Savremena Poljoprivreda), 17(5-6):287-291.

In investigations in Serbia in 1967, two aphid species which attack the roots of maize were identified as *Byrsocripta gallarum* and *Anoecia corni*. Besides being on maize, parthenogenetic generations of *B. gallarum* were found on the following summer hosts: *Alopecurus pratensis, Avena fatua, Bromus arvensis, Bromus mollis, Festuca* spp., *Hordeum murinum, Panicum crus-galli, Poa* spp., *Setaria glauca,* and *Triticum* spp. Colonies of *A. corni* were found on *Dactylis glomerata, Festuca* spp., *Lolium perenne, Poa* spp., and *Setaria glauca*. Populations of both species overwintered on the roots of winter and wild wheats and other summer hosts from the family Gramineae. They were found most often on the roots of *Festuca* spp. and *Poa* spp.

193 Moiz, S. A. and K. M. Nagvi. 1969. Studies on sorghum stem fly *Atherigona varia* var. *soccata* Rondani (Anthonyidae: Diptera). Agriculture Pakistan, 19(2):161-164.

In 1960, *A. varia* var. *soccata* was observed boring the stem of sorghum at Tandojam in the Hyderabad region of Pakistan. Alternate food plants comprised *Sorghum halepense, Pennisetum typhoides, Panicum miliaceum, Panicum miliare, Desmostachya bipinnata, Eleusine* sp., and maize. By-passing from one to another, *A. varia* var. *soccata* was able to breed and remain active throughout the year.

194 Moore, G. C. and A. J. Mueller. 1976. Biological observations of the three-cornered alfalfa hopper on soybean and three weed species. J. Econ. Entomol., 69(1):14-16.

The biology of *Spissistilus festinus* (Say) on soybean and three weed species, *Xanthium pennsylvanicum, Sida spinosa,* and *Cyperus esculentus,* was investigated in greenhouse tests in Arkansas. Adults survived for averages of about 18.7, 26.8, 12.4, and 1.3 days on the four plants, respectively. Reproduction occurred only on soybean and *X. pennsylvanicum.* Nymphal development took 26.8 days on *X. pennsylvanicum* and 18.7 on soybean. Feeding damage was greatest on soybean, followed by *X. pennsylvanicum* and *S. spinosa.*

195 Morgan, H. G. and J. F. Abu. 1973. Weed hosts of Diopsid (Dipt.) rice stem-borers in Ghana. Entomol. Monthly Mag., 108(1295/97):105-106.

Stem-boring larvae of *Diopsis* spp. are important pests of rice in Ghana and other West African countries. Eggs of *Diopsis ichneumonea* L. and *Diopsis apicalis* Dalm (*tenuipes* Wstw.) were found on the leaves of the weed *Echinochloa colonum* growing around rice fields in the southern coastal belt of Ghana. Eggs of *D. ichneumonea* were also found on the weed *Brachiaria lata* in the same area and at the western end of the Accra plains, where no rice is grown.

196 Muller, F. P. 1970. Investigations on the rearing and transfer of populations and clones of the green-spotted potato aphid *Aulacorthum solani* (Kaltenbach, 1843) (Homoptera: Aphididae). Zucht-und Uber tragungsuersuche mit Populationen und Klaren der Grunfleckigen Kartoffelblattlaus *Aulacorthum solani* (Kaltenbach, (1843) (Homoptera: Aphididae). Deutsche Entomologische Zeitschrift, 17(1/3):259-270.

The development on nine plant species of eight stocks of *A. solani* (Kalt.), two of which were clones, was studied in field insectaries in eastern Germany. One of the clones appeared to be restricted to a very large degree to its natural food plant *Filipendula ulmaria.* The other species were polyphagous but did not infest *F. ulmaria, Glechoma hederaceum,* or *Melandrium album,* although the aphid had been observed on *G. hederaceum* and *M. album* in the field. Two of the polyphagous stocks infested potato, *Armoracia lapathifolia,* broad bean (*Vicia faba*), *Myosotis palustris, Digitalis purpurea,* and *Geranium pusillum.*

197 Munshi, G. H. and A. K. Mecci. 1969. Four new records of alternate host plants of *Laphygma exigua* (Hubner) Noctuidae: Lepidoptera. Agri. Pakistan, 20(3):277-278.

In Tandojam, Pakistan, larvae of *Spodoptera* (*Laphygma*) *exigua* were found for the first time feeding on lettuce, knol kohl (*Brassica oleracea* var. *gangybides* (*Brassica oleracea* var. *caulorapa*)), *Cosmos sulphureus,* and *Calendula officinalis.*

198 Musich, E. N. 1976. Cutworms as pests of berry crops. Zashchita Rastenii, No. 41, p. 47.

The most harmful species to berry crops were identified as *Graphiphora augur* (F.), *Tripaena augur*, and *Xestia c-nigrum* (L.) (*Graphiphora c-nigrum*), with somewhat less damage caused by *Polia bombycina* (Hfn.), *Amphipyra livida* (Schiff.), *Eugraphe sigma* (Schiff.), and *Lacanobia thalassina* (Hfn.) (*Mamestra thalassina*). Observations in 1969-74 showed that the larvae were most injurious in years with a long cold spring, when development was delayed and weeds were abundant as alternative food. General observations showed that the adults of these moths required supplementary feeding before oviposition, and this took place on flowering weeds. The larvae at first fed on the weeds and migrated from them to black currant and raspberry. It is proposed that weed control is the most important method of protecting berry crops.

199 Narchuk, E. P. 1968. On the characteristics of the complex of grass flies (Diptera, Chloropidae) injurious in agriculture. Zoologicheskii Zhurnal, 47(9):1343-1353.

In the Soviet Union and neighboring countries, 73 species of Diptera are known as pests of cereal and fodder grasses including Chloropids that feed on field crops. In the Soviet Union, 39, 20, 16, 14, 9, 3, and 8 species were listed as being injurious to wheat, barley, rye, oats, maize, millet, and rice, respectively, and 20 species occurred on *Agropyron repens*. The injurious species were reviewed, and four groups were distinguished according to their economic importance based on population numbers and the type of damage caused.

200 Nasr, El-S. A. and F. Nassif. 1970. Behavior of egg-laying and population density of the cotton leafworm, *Spodoptera littoralis* (Boisd.), on different host plants (Lep., Noctuidae). Bull. de la Societe Entomologique d'Egypte, 54:541-544.

Field experiments were carried out on the Dokki Farm, Cairo, Egypt, during 1966 and 1967. The results show that there is a real preference for some hosts over others and that the adults have the ability to choose suitable sites for oviposition. At the same time, the observations revealed that the upper surfaces of the leaves of *Hibiscus cannabinus* and *Kerrie japonica* were preferred for egg-laying, which may be connected with their narrow-convex boat-shaped blades.

201 Niemczyk, H. D. and J. K. Flessel. 1970. Population dynamics of alfalfa weevil eggs in Ohio. J. Econ. Entomol., 63(1):242-247.

In studies in Ohio in 1965-68 on the population dynamics of the eggs of *Hypera variabilis* (Hbst.) (*postica* (Gylh.)), weekly or biweekly square foot samples of all plant material to the group surface were collected from October to June from lucerne fields in two northern and two southern areas of the state and dissected by hand to determine the egg population. The plants, other than lucerne, in which eggs were found were mainly *Trifolium pratense* (90%) and miscellaneous grasses (10%). Eggs were occasionally found in *Lamium amplexicaule* and *Stellaria media*.

202 Nikolova, V. 1971. Noctuids--dangerous pests of plants. The silver Y moth. Rastitelna Zashchita, 19(6):13-16.

The larvae of *Agrotis ipsilon* (Hfn.) were injurious to more than 30 cultivated and 20 wild plant species in Bulgaria. The greatest damage was caused to tobacco, beet, maize, and vegetable crops. Populations of *A. ipsilon* (Hfn.) were reduced by weed eradication.

203 Olmi, M. 1968. Rice field leaf and planthoppers in the neighborhood of Vercelli (Homoptera: Auchenorrhyncha). Studies of the C.N.R. working party for virus diseases: CXXI. Cicaline della risaia da vicenda vercellese (Homoptera: Auchenorrhyncha). Studi del gruppo di lavoro del C.N.R. per le virosi: CXXI. Annalidella Facolta di Scienze Agrarie della Universita degli Studi di Torino, 4:247-260.

Notes are given on the distribution and food plants of five Cicadellids, two Delphacids, and two Cercopids found on rice near Vercelli in the Po Valley, in northern Italy, during 1964-67. *Tettigella (Cicadella) viridis* (L.) and *Macrosteles sexnotatus,* which are considered habitual pests of rice, since nymphs as well as adults infest it, also were found to feed on grasses.

204 Ouattara, S., P. Jolivet, and E. van Parys. 1977. Second list of insects and their food plants in Upper Volta and in the surrounding regions. Seconde liste des plantes-hotes en Haute-Volta et dans les regions limitrophes. Bobo-Dioulasso, Upper Volta; FAO Projet Renforcement Protection des Plantes. Ed. 2, 107 pp. (Fr).

This list of insects and their food plants in Upper Volta is a continuation of a previous one and includes corrections and additions to this. It is not exhaustive, although including some insects that were found on the plants but were not necessarily feeding on them. In the main part of the work, the wild and cultivated plants of Upper Volta and the surrounding regions are enumerated alphabetically by genera, with each species given its common name (where known) as well as its scientific name and having a list of insects that were found on it. A list of Acridoidea of the central valley of the Niger, based on that of O. T. Yonli in 1975 and referring more to the Sahel region than to Upper Volta, is appended, together with indices to the scientific names of the insects and plants in the main list.

205 Pandey, S. N. and J. K. Bogawat. 1969. Growth and development of *Papilio demoleus* (L.) in relation to a wild plant. Indian J. of Entomol., 31(1):92.

Psoralea corylifolia, a weed previously recorded as an alternative food plant of *Papilio demoleus,* was compared in 1967 at Udaipur in Rajasthan, India, with lemon (*Citrus medica*) for its ability to support this pest. The growth index, calculated according to the method of B. K. Srivastavg, and survival to the adult state proved to be lower on *P. corylifolia* than on lemon, but the weed was able to support complete development of the butterfly from May to November.

206 Pandey, S. N. and J. K. Bogawat. 1968. Note on the effects of certain wild plants, temperature, and insecticides on the growth and development of *Agrotis segetum* Schiffer-Mueller (Lepidoptera: Noctuidae). Indian J. of Agri. Sci., 38(5):826-827.

Comparative laboratory tests were carried out with wild food plants of *Agrotis segetum* in Rajasthan, India. The wild food plants were: *Amaranthus spinosus* L., *Alternathera echinata* Sm., *Sida* sp., *Trianthema portulacastrum* L., and *Tridax procumbens* L.

207 Patel, R. K. 1975. Record of new alternate host plant of paddy leaf roller, *Cnaphalocrocis medinalis* Gn. Indian J. Entomol., 35(4):347.

Larvae of *C. medinalis* were observed feeding inside rolled leaves of *Pennisetum pedicellatum* growing along the borders of rice fields in Madhya Pradesh during

1969-70. This is the first record of the rice pest infesting this grass in India.

208 Patel, R. K., B. S. Choudary, and A. K. Khatri. 1975. New alternate host of leaf roller, *Marasmia trapezalis* Gn. (Lepidoptera: Pyralidae). J. of Bombay Natural History Soc., 72(1):225.

It was reported (Madhaya Pradesh, India) that larvae of *Marasmia trapezalis*, a minor pest of various graminaceous crops, were found on *Brachiaria mutica*.

209 Perju, T. and I. Palagesiu. 1971. Curculionidae (Coleoptera) developing on species of wild clover (*Trifolium* sp.). Curculionide (Coleoptera) care se desvolta pe diferite specii spontane de trifoi (*Trifolium* sp.). Studii si Cercetari de Biologie (Zoologie), 23(4):377-380.

In survey of Curculionidae occurring on species of wild clover in Transylvania and Banat between 1956 and 1968, the following species were recorded as attacking the flower heads. *Apion apricans* Hbst., *Apion trifolii* (L.), *Apion seniculus* Kby., *Apion assimile* Kby., *Apion dissimile* Germ., *Apion dichroum* Bed., *Apion nigritarse* Kby., *Apion varipes* Germ., *Apion filirostre* Kby., *Miccotrogus picirostris* (F.), *Hypera* sp., and *Sitona* sp. In all, 18 species of *Apion* were collected. Wild red clover (*Trifolium pratense*) is the main source of infestation of cultivated red clover by *Apion apricans* and *Apion trifolii*, wild white (*Trifolium repens*) and alsike clover (*Trifolium hybridum*) an important source of infestation of this species by *Apion dichroum* and *Apion nigritarse*. *Apion seniculus*, the stem weevil, is an important pest of alsike clover.

210 Peschken, D. P. 1977. Host specificity of *Tingis ampliata* (Tingidae: Heteroptera): a candidate for the biological control of Canada thistle (*Cirsium arvense*). Canadian Entomol., 109(5):669-674.

The weed *C. arvense* was the only food plant previously confirmed for *T. ampliata*, but adults from a laboratory stock in Canada that was derived from England developed fertile eggs on two economic plants, globe artichoke and safflower, and nymphs developed into adults on globe artichoke. It is concluded that *T. ampliata* should not be released in Canada for control of *C. arvense*.

211 Prakasa Rao, P. S., P. Israel, and Y. S. Rao. Epidemiology and control of the rice hispa *Dicladispa armigera* Oliver.

Information on the life history, incidence, and control of *D. armigera* on rice is reviewed from the Indian and other literature and also from recent work carried out in the Cuttack district. When rice was not available, populations maintained themselves on *Paspalum sanguinale*, *Mnesethia laevis*, and other wild grasses.

212 Prasad, S. N. 1968. On the relationship of the citrus blossom midge (*Dasineura citri*) with *Gnaphalium indicum*--a citrus undergrowth. Caecidologia Indica, 3(1):25-28.

At Naini near Allahabad in India, *D. citri* Grover and Prasad was found to oviposit not only in citrus but also in the flower buds of *Gnaphalium indicum*, a wild composite commonly found growing beneath it. After further investigations, the conclusion was reached that *G. indicum* was not a true alternative food plant of *D. citri*, but that its buds were used by the gravid females as receptacles for surplus eggs when citrus flowers were not available during hot dry weather.

213 Priore, R. 1974. *Ceresa bubalus* Fabr. (Homoptera-Membracidae) in Campania and in Calabria. Annali della Facolta di Scienze Agrarie della Universita degli Studi di Napoli, 7:148-152.

All stages of *C. bubalus* are briefly described and notes are given on its biology based on field and laboratory observations in the regions of Campania and Calabria, Italy. There was one generation a year and the eggs overwintered. The eggs were laid in slits made in the young twigs of fruit trees, but the nymphs, which hatched in May, immediately left the trees and fed on wild and cultivated herbaceous plants. In Campania, oviposition slits were observed mainly on peach and hazel, and the immature stages on sunflower, *Ocimum basilicum*, and weeds.

214 Pusching, M. K. and F. T. Turpin. 1977. Survival and development of black cutworm (*Agrotis ipsilon*) (Lep., Noctuidae) larvae on various species of crop plants and weeds. Environ. Entomol., 6(1):63-65.

Larval development, pupation, and adult emergence of *A. ipsilon* were investigated using 16 possible larval food sources. Food sources included crop plants, weeds, and field debris. Larval survival was highest on *Poa pratensis*, *Rumex crispus*, and *Triticum aestivum*, while no larval survival occurred on *Setaria faberii* or debris. Larval development from egg to pupa varied from 24.6 days on *T. aestivum* to 47.0 days on *Ipomoea purpurea*.

215 Puttarudriah, M. and Eswaramurthy. 1976. *Planococcoides* sp. nr. *robustus*, a mango root mealybug, and its control. Current Research, 5(12):205-207.

A species of *Planococcoides* near to *Planococcoides robustus* Ezzat and McConnell was found infesting the roots of mango in the Kolar district of Karnataka, India, in 1971-1972. The mealybug was also found infesting grapevine and the weed *Conyza ambigua*.

216 Pye, R. E. 1975. Plant host sequence of major cotton insects in southern Arizona. USDA, ARS W-24, 9 pp.

The population of insect pests of cotton, with special reference to their occurrence on alternative food plants, including *Sisymbrium irio*, wheat, barley, sorghum, lucerne, and weed species of *Amaranthus*, was surveyed in Arizona in 1968-73 and the results were presented. The cotton pests dealt with include *Lygus* spp., *Heliothis zea* (Boddie), *Spodoptera exigua* (Hb.), *Spanagonicus albofasciatus* (Reut.), and *Rhinacloa forticornis* Reut.

217 Quintana-Muniz, V. and D. W. Walker. 1970. Host plant choice in the laboratory of first-stage sugarcane borers in Puerto Rico. J. Econ. Entomol., 63(3):988-989.

In further studies in Puerto Rico on the food plant range of *Diatrara saccharalis* (F.), newly hatched larvae were confined in vessels containing 22 graminaceous plant species. All were somewhat attractive and relatively acceptable. The five most attractive were *Euchlaena mexicana, Cymbopogon citratus, Coix lacryma jobi*, maize (variety *Mayorbela)*, and *Pennisetum purpureum*. The five most acceptable were *E. mexicana, C. lacryma jobi*, maize (variety *Mayorbela)*, sorghum (variety C 317), and sugarcane (variety P. R. 980). Other species in decreasing order of attractiveness, were: *Panicum maximum*, sugarcane (var. M275), *Paspalum secans, Paspalum virgatum, Eleusine indica, Axonopus scoparius, Cymbopogon nardus, Tripsacum laxum, Oryza sativa, Tripsacum dactyloides, Paspa-*

lum plicatulum, Leptochloa scabra, Echinochloa colonum, Hymenachne amplexicaulis, and *Gynerium sagittatum.*

218 Quisenberry, S. S., T. R. Yonke, and D. D. Lopp. 1978. Key to the genera of certain immature treehoppers of Missouri with notes on their host plants (Homoptera: Membracidae). J. Kansas Entomol. Soc., 51(1):109-122 (En, 20 ref., 62 fig.).

A key for the identification of the immature stages of 24 of the 26 genera of Membracidae found in Missouri is presented. Illustrations of the fifth-instar nymphs of 24 species are given. Food plant records for the nymphs of 13 species are listed. These food plants included forest trees and also noxious weeds such as *Ambrosia trifida.* Immature host plant records:

Campylenchia latipes (Say): *Aster tubinellus* Lindl., *Polygala* sp., *Coreopsis tripteris* L.

Entylia bactriana Germar: *Ambrosia trifida, Eupatorium serotinum* Michx., *Lactuca floridana* (L.) Gaertn., *Helenium autumnale, Cirsium discolor* (Muhl.) Spreng., *Cirsium altissimum* (L.) Spreng.

Publilia concava (Say): *Silphium perfoliatum* L., *Verbesina alternifolia* (L.) Britt., *Cacalia muhlenbergii* (Schultz-Bip.) Fern., *Aster sagittifolius* Wild., *Solidago ulmifolia* Muhl., *Solidago gigantea* Ait., *Helianthus hirsutus* Raf., *Erigeron annuus* (L.) Pers., *Helianthus tuberosus* L., *Eupatorium purpureum* L., *Rudbekia laciniata* L., *Rudbekia triloba* L., *Ambrosia trifida* L.

Stictocephala bubalus (Fab.): *Silphium perfoliatum* L.

The hosts of the other species named in the article are trees.

219 Radev. R. 1968. Studies on the bioecology of the cotton leaf aphid--*Aphis gossypii* Glov. (Homoptera, Aphididae)--on cotton. Rastenievudni Nauki, 5(10): 109-131.

Studies were made in 1953-59 in Bulgaria on the bionomics of *Aphis gossypii,* which is the most injurious pest of cotton there, reducing the yield by up to 70%. *A. gossypii* is unable to overwinter in the field in Bulgaria, but is removed by ants to their nests. It migrates to cotton from various weeds and cultivated plants. Weeds of greatest significance were: *Amaranthus retroflexus, Atriplex niteus, Capsella bursa-pastoris, Cirsium arvense, Convolvulus arvensis, Malva* sp., *Polygonum aviculare, Sinapis arvensis, Sonchus oleraceus,* and *Veronica campylopada.*

220 Radev, R. and S. G. Stefanov. 1974. Study on *Thrips tabaci* Lind. as a pest of cotton. Rastenievudni Nauki, 11(5):108-120.

Thrips tabaci invades weed species such as *Sinapis arvensis, Atriplex niteus, Anthemis arvensis, Amaranthus retroflexus, Cirsium arvense, Euphorbia* sp., *Veronica campylopoda,* and *Cardaria (Lepidium) draba* in early spring, and from these weeds and from onion and sunflower (*Helianthus annuus*) the insects migrate to cotton after its germination. A direct connection was found between the densities of *T. tabaci* on weeds and on cotton. It is possible to forecast the intensity of attack on cotton by examining thrips density on weeds in early spring. *Thrips tabaci* is the most injurious species, but the form *Thrips*

tabaci pullus Uzel and *Thrips flavus* Schr. have also been observed over the past 10 years in Bulgaria.

221 Rai, P. S. and G. Gowda. 1975. A leaf eating caterpillar, *Leonondra vittata* Walker (Lasiocampidae), new on rice in Kamataka, India. Rice Entomology News Letter, No. 3, p. 33.

Larvae of *L. vittata* were found for the first time on transplanted rice seedlings at Bangalore, Karnataka, India, during 1973-1974. Larvae were also found on *Imperata cylindrica* growing on field bunds.

222 Rakhmanova, A. V. 1969. On weevils of the genus *Apion* (Coleoptera, Apionidae) associated with wild leguminous plants in the Leningrad region. Ent. Rev., 48(4):509-514.

Sixteen species of the weevil genus *Apion* were found on 14 species of wild legumes in Leningrad Province. Clover seed pests which infest wild clover species were, at the same time, major pests of cultivated seed clover. The species of weevil included: *Apion aestimatum, Apion aestivum, Apion apricans, Apion assimile, Apion cerdo, Apion ervi, Apion facetum, Apion flavipes, Apion loti, Apion meliloti, Apion seniculus, Apion spensei, Apion subulatum, Apion tenue, Apion viciae,* and *Apion virens.* The species of legume included: *Lathyrus pratensis, Lotus corniculatus, Medicago* sp., *Melilotus* sp., *Trifolium campestre, Trifolium hybridum, Trifolium medium, Trifolium montanum, Trifolium pratense, Trifolium repens, Trifolium spadiceum, Vicia cracca,* and *Vicia sepium.*

223 Rao, K. J. and D. K. Thirumalachar. 1977. New record of alternate host plants of groundnut leaf miner *Stomopteryx subsecivella* Zeller (Syn: Nerteria Meyrick) (Lepidoptera: Gelichiidae). Curr. Sci., 46(3):91-92.

Stomopteryx subsecivella, a pest of groundnut or peanut (*Arachis hypogaea*), was observed for the first time in India mining the leaves of wasteland weeds: *Indigofera hirsuta, Phaseolus calcaratus,* and *Medicago sativa.*

224 Rao, S. V. R. 1976. Studies on the biology, bionomics, and chemical control of the sorghum midge, *Contarinia sorghicola* (Coquillett). Entomologists' Newsletter, 6(2):14-15.

Field and laboratory observations of the *C. sorghicola* on sorghum in Delhi showed that the midge was active from late August to early November, the population peaks depending on temperature, humidity, rainfall, and the availability of sorghum in flower. *Sorghum halepense* and sudangrass (*Sorghum vulgare* var. *sudanensis*) were found to be alternative food plants and diapause sites for the midge.

225 Ravtapaa, J. 1970. Preference of cereal aphids for various cereal varieties and species of Gramineae, Juncaceae, and Cyperaceae. Annales Agriculturae Fenniae, 9:267-277.

The preference of *Macrosiphum avenae* (F.) and *Rhopalosiphum padi* (L.) among seedlings of numerous varieties of cereal crops, grasses, rushes, and sedges were studied in the laboratory in Finland from 1963-68.

226 Reddy, K. V. S. and J. C. Davies. 1977. Species of *Atherigona* in Andhra Pradesh. PANS, 23(4):379-383.

Records of *Atherigona* spp. bred from cultivated cereals, minor millet, and wild grasses were given. *Atherigona soccata* Rond. was the most common species present on sorghum and it was also recorded from maize, pearl millet (*Pennisetum americanum*), *Echinochloa colonum*, *Eriochloa procera*, *Cymbopogon* sp., and *Paspalum scobiculatum*. The numbers of *A. soccata* bred from grasses were very low. Data indicated that species of *Atherigona* were in general highly specific in choice of plant host. *Atherigona falcata* (Thoms.) was the most common species on grass and tended to favor *Echinochloa colonum* and *Echinochloa crus-galli*. *Atherigona approximata* Mall. was dominant on pearl millet, *Atherigona pulla* (Wied.) on *Panicum psilopodium*, and *Atherigona oryzae* on *Digitaria adscendens*. *Atherigona eriochloae* Mall. was recovered from both sorghum and *E. procera*. This was previously known only from the paratype described in 1926. Other species were bred from a range of host grasses.

227 Reed, W. Some aspects of the ecology of *Earias* spp. in East Africa. Cotton Research Corp., London.

Of the six species of *Earias* found in East Africa, only *Earias biplaga* Wlk. and *Earias insulana* (Boisd.) have been recorded on cotton. As part of a study of *Earias* (mainly these two species) carried out principally in Tanzania, a qualitative and quantitative survey was made of the occurrence of species of Malvaceae, to which these bollworms are virtually restricted. Of the 36 species of Malvaceae present in the region of Ukiriguru in western Tanzania, all but two were found to be food plants of *Earias* spp., but many were so rare that they played a negligible role in the annual incidence of *Earias* populations. Contrary to what had been believed, *Hibiscus* spp. and *Abutilon* spp. were of little importance as alternative food plants of the major cotton pest *E. biplaga*. The major alternative food plant was *Waltheria indica*, which had not previously been recorded as a food plant of *Earias*. Populations of *E. biplaga* on *W. indica* increased before dispersing to cotton. The level of infestation on cotton in April and May could be predicted from the numbers of larvae present on *W. indica* in January and February.

228 Reinert, J. A. 1977. Field biology and control of *Haplaxius crudus* on St. Augustine grass and Christmas palm (Hom., Cixiidae). J. Econ. Entomol., 70(1): 54-56.

Hapaxius crudus developed readily on *Stenotaphrum secundatum*, *Paspalum notatum*, and *Cynodon dactylon*. Adults fed on these turfgrasses and on at least nine species of palms including *Veitchia merrillii* and *Colds nucifera*.

229 Reis, P. R., A. Costa, Jr., and L. C. Lobato. 1976. *Blissus leucopterus* (Say, 1832) (Hemiptera-Lygaeidae), a new pest of grasses, introduced in the state of Minas Gerais. *Blissus leucopterus* (Say, 1832) (Hemiptera-Lygaeidae) nova praga de gramineas, introduzida no Estado de Minas Gerais. Anais da Sociedade Entomologica do Brasil, 5(2):241-242.

Blissus leucopterus was found for the first time in the Brazilian state of Minas Gerais in March 1975 on *Brachiaria* sp. and other graminaceous species, both wild and cultivated.

230 Rezwany, N. and D. Schahosseini. 1977. Biology and ecology of the rice stem borer (*Chilo suppressalis* Walker). Entomologie et Phytopathologie Appliquees, No. 43, Pe 1-38; de 3-5.

Chilo suppressalis was found for the first time on rice in northern Iran in November 1972 and spread rapidly over the whole rice-growing area. In the absence of rice, oviposition sometimes occurred on the weed *Echinochloa crus-galli*. After rice harvest, some of the larvae remained in the stubble and others migrated to weeds, especially *E. crus-galli* and *Coix lacryma jobi*, at the edge of the rice fields to overwinter.

231 Robert, Y. 1969. First observations on the biology of *Capitophorus horni* in western France. Premieres observations sur la biological de *Capitophorus horni* Borner (Homoptera: Aphididae) dans l'ouest de la France. Annls. Zool. Ecol. Anim., 1(1):39-54.

Although *C. horni* has not previously been recorded from France, it has been found to be widely distributed in the west and southeast of the country on various species of thistle (*Cirsium* and *Carduus*) and one artichoke (*Cynara scolymus*). In Brittany, it causes damage of economic importance to artichoke, not previously recorded as a food plant of the aphid, by feeding on the lower surface of the leaves and petioles, which retards and reduces growth.

232 Rogers, C. E. 1974. Bionomics of the carrot beetle in the Texas Rolling Plains (USA) (*Bothynus gibbosus* (Col., Scarabaeidae)). Environ. Entomol., 3(6):969-974.

Adult *B. gibbosus* were found to be destructive to several field crops in the Rolling Plains and 24 species of non-cultivated plants were identified as new hosts. Preferred hosts are *Helianthus petiolaris, Helianthus annuus, Amaranthus palmeri, Conyza canadensis, Prionopsis ciliata, Solanum elaeagnifolium,* and *Silphum albiforum*.

233 Roome, R. E. Field studies on the biology of *Heliothis armigera* (Hb.) (Lepidoptera: Noctuidae) in Botswana. Agri. Research Station, Gabarone, Botswana. 32-46.

During studies on the control of major insect pests of crops in Botswana begun in 1968, investigations were carried out on the bionomics and natural enemies of *H. armigera*, the most important pest of cotton, being grown as a cash crop. It was found that larvae of the bollworm are able to complete their development on 16 other species of plants, including all the major crops grown in the country, and cause damage of economic importance. Wild food plants are of importance early in the season before major crops such as sorghum, maize, and sunflower (*Helianthus annuus*) are sown.

234 Root, R. B. and J. O. Tahvanainen. 1969. Role of winter cress, *Barbarea vulgaris*, as a temporal host in the seasonal development of the crucifer fauna. Ann. Entomol. Soc. Am., 62(4):852-855.

Because of its phenology and habitat distribution, *B. vulgaris* is the principal food plant of several members of the crucifer fauna at the beginning and close of the growing season in New York State. The invertebrates found on it during spring are listed. The density of herbivores was higher on plants growing in previously cultivated plots than it was on nearby plants growing in an old hayfield. Large populations of flea-beetles overwintered near *B. vulgaris* at the immediate edge of cultivated fields. The relations of the results to other studies on the crucifer fauna and to the control of flea-beetles are noted.

235 Roth, J. P. and H. N. Pitre. 1975. Seasonal incidence and host plant relationships of the sorghum midge (*Contarinia sorghicola*: Dipt., Cecidomyiidae) in Mississippi (USA). Ann. Entomol. Soc. Am., 68(4):654-658.

Emergence of adult *C. sorghicola* from overwintering sites began in early April 1972, peaked in mid-May when *Sorghum halepense* was in full bloom, and ended by the 3rd week in June in northern Mississippi. Wheat planted in sorghum stubble protected overwintered *C. sorghicola*. *Contarinia sorghicola* emergence from *S. halepense* peaked in mid-July when volunteer and early planted sorghum plantings were in bloom and dropped sharply by late July. There were 9-11 generations on *S. halepense* and 11-14 on sorghum plantings in the area. Sorghum blooming in August and September was damaged extensively.

236 Rummel, D. R. and P. L. Adkisson. 1970. Distribution of boll weevil-infested cotton fields in relation to overwintering habitats in the High and Rolling Plains of Texas. J. Econ. Entomol., 63(6):1906-1909.

Following a reproductive-diapause control program against *Anthonomus grandis* Boh. on cotton in an area consisting of eight counties on the High and Rolling Plains of Texas in 1965, the distribution of infested cotton fields was found to show a non-random clumped pattern in 1966. Under the conditions of low weevil density that prevailed during the investigations, the distribution of infested fields appeared to be influenced primarily by the abundance and nearness of favorable overwintering sites, mainly stands of sand shinnery oak (*Quercus havardii*) or mesquite (*Prosopis glandulosa*) within the cotton-growing area. *Sorghum almum* L. and *Sorghum halepense* (L.) Pers. also served as overwintering hosts for *A. grandis*.

237 Saba, F. 1971. *Tetranychus yusti*, a spider-mite of potential economic importance. J. Econ. Entomol., 64(1):141-144.

Laboratory studies were carried out in Florida on the bionomics of *T. yusti* McG. In tests in which 85 plant species were evaluated as food plants, representatives of the families Leguminosae, Malvaceae, Gramineae, and Compositae were the best hosts. The following species were very good host plants: *Abelmoschus esculentus, Caladium hortulanum, Chenopodium botrys, Cynodon dactylon, Echinochloa colonum, Eleusine indica, Glysine max, Gossypium hirsutum, Helianthus annuus, Hordeum vulgare, Lathyrus odoratus, Lolium temulentum, Melilotus alba* var. *uban, Panicum miliaceum, Phaseolus lunatus, Phaseolus vulgaris, Pisum sativum, Richardia scabra, Rosa* hybrids, *Sesbania exaltata, Sida rhombifolia, Sonchus oleraceus, Tagetes patula, Trifolium repens, Triticum sativum,* and *Vigna sinensis.* The following species were good host plants: *Amaranthus blitoides, Amaranthus spinosus, Ambrosia artemisifolia, Arachis hypogaea, Chenopodium amaranticolor, Clerodendron fragrans, Cyperus esculentus, Digitaria sanguinalis, Echinochloa crus-galli, Fagopyrum esculentum, Geranium carolinianum, Impomoea batatas, Lantana camara, Lepidium virginicum, Orontium aquaticum,* and *Paspalum distichum.*

238 Sabine, B. N. E. 1969. Occurrence of the pink-spotted bollworm (*Pectinophora scutigera* (Holdaway)) in Queensland. J. Aust. Inst. Agri. Sci., 35(2):99-102.

Early records of *P. scutigera* in Queensland indicated that it occurred in districts thoughout the state in association with its two major wild food plants, *Hibiscus tiliaceus* and *Thespesia populnea,* of which the latter is restricted to the far north. Recent records of it on cultivated cotton are confined to central and northern coastal and subcoastal districts. In an extensive survey of

malvaceous plants in central coastal Queensland, only *H. tiliaceus* was infested, and *P. endema* Common was the only lepidopterous species attacking *H. heterophyllus*, on which *P. scutigera* was previously recorded. With the exception of *H. tiliaceus* and possibly *T. populnea*, native malvaceous plants are considered to be of little importance in the dispersal and overwintering of *P. scutigera*, and the most important factors in the overwintering of populations on farms are cotton plants left standing after harvest and ratoon crops.

239 Salinas, P.J. and A.D. Bautista. New distribution areas of *Phylloxera* in Venezuela. Nuevas areas de distribucio de la filoxera en Venezuela. Proc. Viticulture Symposium, Fondo de Desarrollo Fruticola Barquismeta, pp. 152-156.

Following the discovery of *Viteus vitifoliae* (Fitch) (*Phylloxera vitifoliae*) on grapevines in Venezuela and on wild species of *Vitis*, further searches for occurrence of this aphid in the country were made. It was not found again on cultivated grapevines but was found on *Viteus caribaea* (of which *V. tiliifoliae* is a synonym) in almost all areas where this wild vine occurred.

240 Sanchez, R. H. A. and G. Brevo Viana. 1969. The life cycle of the potato leaf miner *Scrobipalpula absoluta* in the Department of Narino. Ciclo biologica del gusana minador de la papa *Scrobipalpula absoluta* (Meyrick) en el Departmento de Nario. Rev. Cienc. Agr., 1(2):3-19.

A Gelechiid that causes damage to potato in the districts of Pasto, Tuquerres, and Ipiales in the Department of Merino, Colombia, has been identified as *S. absoluta*, a species that has not previously been recorded from Colombia, where the damage caused has been attributed to *Phtorimaea* (*Gnorimoschema*) *operculella* (Zell.). Information was given on the world distribution of *S. absoluta*, its taxonomic position, and the type of damage caused. All stages are described, its bionomics and control are reviewed, and an account is given of studies on its bionomics on potato carried out in Narino, mainly in the laboratory. In the field, the larvae were found only in the leaves of potato and *Solanum nigrum americanum*.

241 Sandhu, G. S., B. Singh, and M. S. Dhooria. 1975. Effect of rain on the population of *Oligonychus indicus* (Hirst) (Acarina: Tetranychidae) on different varieties of maize (*Zea mays* L.) in the Punjab, India. International J. Acarol., 1(2):10-13.

Oligonychus indicus, an important pest of sugarcane, sorghum, *Sorghum halepense*, and other grasses in the Punjab, India, has recently begun to attack spring maize and pearl millet (*Pennisetum typhoides*) during pre-monsoon months.

242 Sant, L. E. van't, J. G. C. Bethe, H. E. Vijzelman, and J. C. Freriks. 1975. Observations on mining flies (*Napomyza* spp., Diptera, Agromyzida) on Witloof chicory, carrots, and camomile. Waarnemingen over mineervliegen (*Napomyza* spp., Diptera, Agromyzidae) in witlof, wortelen, enkamillen. Verslagen van Landbouwkundige Onderzoekingen No. 840, 8 + 44 pp. Nl, en 43 ref., 22 fig. (also: Mededelinger, Instituut voor Plantenziekenkundig Onderzoek, no. 696.)

Observations were reported on the life history, food plants, and control of *Napomyza cichorii* Spencer on Witloof chicory (also found on wild *Cichorium* sp., lettuce, endive (*Cichorium endivia*), and *Sonchus* sp.); *Napomyza carotae* Spencer on carrot (also found on caraway (*Carum carvi*); and *Napomyza lateralis* (Fall.) on camomile (*Matricaria discoidea*) (also found on *Senecio vulgaris*) in the

Netherlands. Attention was drawn to the recent separation of these closely related species, which had previously been known as *Napomyza lateralis*. *Napomyza chichorii* was able to overwinter as larvae or pupae in a variety of sites, including chicory roots remaining in the soil and sprouting, in the soil itself, in ploughed-in chicory leaves, in discarded heads in the field or compost heap, in weeds, and in the seeds of chicory.

243 Saxena, D. K. 1974. Some new host plants of *Ferrisia virgata* Cockrell. Indian J. Entomol., 36(4):367.

Ferrisia virgata, a polyphagous pest widely distributed in India, was found infesting soybean, kakri (*Cucumis melo*), poyee (*Basella alba*), ganthora (*Dioscorea esculenta*), cauliflower, and the weeds *Cyperus rotundus*, *Echinochloa colonum*, and *Cynodon dactylon* in Madhya Pradesh, India.

244 Schalk, J.M. 1973. Wild and cultivated host plants of some economically important aphids of northern Iran. J. Econ. Entomol., 66(2):552-553.

The survival of *Acyrthosiphon pisum* (Harris), *Aphis craccivora* Koch, and *Therioaphis trifolii* (Monell) on 31 species of wild and cultivated plants was investigated in field and greenhouse tests in northern Iran. All three aphids infested various plants of the family Leguminosae, but *A. craccivora* was the only one to survive on plants of other families. *A. craccivora* reproduced on *Amaranthus retroflexus* in addition to the Leguminosae *Alhagi camelorum*, *Lens culinaris*, *Medicago sativa*, *Melilotus alba*, *Trigonella foenum-graecum*, and *Vicia faba*. *A. pisum* reproduced on *Medicago sativa*, *Melilotus alba*, *Ononis spinosa*, *Phaseolus vulgaris*, *Trifolium pratense*, and *Vicia faba*. *T. trifolii* reproduced on *Alhagi camelorum*, *Cicer arietinum*, *Melilotus alba*, and *Trigonella foenum-graecum*.

245 Scheibelreiter, G. and P. Inyang. 1974. *Epilachna similis* Muls. (Coleoptera, Coccinellidae), a minor pest on maize in Ghana. Ghana J. Agri. Sci., 7(2):75-79.

Epilachna similis was found on rice in Ghana for the first time in 1970 and has since been found on maize, sugarcane, and sorghum. In the laboratory, it was found that larvae and adults fed to about the same extent on wheat, sorghum, rice, maize, and *Pennisetum purpureum*, but did not feed on sugarcane in the presence of other plants.

246 Schliesskle, J. 1977. On the food plant range of the gall-mite *Aculus fockeui* Nal. & Trt. and the effect of weather and control measures on population development. Zum Wirtspflanzenkreis der Gallmilbe *Aculus fockeui* Nal. et Trt. und zum Einfluss der Witterung and Bekampfungsmassnahmen auf die Populationsentwicklung. Institut fur Pflanzenkrnkheiten and Pflanzenschutz, Hanover Technical University, Hanover, German Federal Republic. Source: Mitteilungen aus der Biologischen Bundesanstalt fur Lanund Forstwirtschaft Berlin--Dahlem (1977) No. 178,[22+] 288 pp. (Berlin).

Aculus fockeui is restricted to species of *Prunus*, and out of the 17 food plants now known, 11 occur in the north of the German Federal Republic. Infestation is heaviest on cultivated varieties of sour cherry, *P. cerasus*, *P. domestica* (plum), damson, and peach. Four further species, *P. cerasifera* "Nigra", *P. cistena*, *P. pseudocerasus*, and *P. triloba*, were known likewise to be food plants. Wild *Prunus* species are the main source of infestation, not-

ably cherry, *P. mahaleb*, and *P. spinosa*. No infestation was detected on *P. padus* or *P. serotina*.

247 Schuster, M. F., C. A. Richmond, J. C. Boling and H. M. Graham. 1969. Host plants of the cotton fleahopper in the Rio Grande Valley: phenology and hibernating quarters. J. Econ. Entomol., 62(5):1126-1129.

In investigations in the Lower Rio Grande Valley of Texas in 1965-68, the phenology of *Psallus (Pseudotomoscelis) seriatus* (Revt.) on its native food plants (other than cotton), namely *Croton capitatus* var. *albinoides*, *Solanum elaeagnifolium*, *Monarda punctata* var. *coryii*, *Oenothera laciniata* var. *laciniata*, *Oenothera speciosa* var. *childsii*, *Oenothera serrulata* var. *serrulata*, *Monarda citriodora*, and *Tidestromia lanuginosa* var. *lanuginosa* was investigated. The insects left early-season weeds as they matured in May and either moved to neighboring cotton or migrated northward into south-central and central Texas. Overwintering occurred in the egg stage on the wild food plants. Several other cool-season weeds and crops also were found as early season hosts of the cotton fleahopper: *Verbena bipinnafida*, *Verbena ciliata*, *Ratibida columnaris*, *Nama hispidum*, *Medicago sativa*, *Gaura villosa*, *Gaura brachycarpa*, *Parthenium hysterophorus*, and *Helianthus annuus*.

248 Sen, P. and S. Chakravorty. 1970. Biology of *Hispa (Dicladispa) armigera* Oliv. (Coleoptera: Chrysomelidae). Indian J. Entomol., 32(2):123-126.

Information was given on the life history and habits of *Dicladispa (Hispa) armigera* reared on bagged leaves of growing rice plants in the Nedia district of West Bengal, India. The beetle had six generations a year, of which five were on rice and one on alternative graminaceous food plants. Plants on which it was recorded for the first time were *Dactyloctenium aegyptium*, *Echinochloa colonum*, *Digitaria adscendens*, *Eleusine indica*, *Leptochloa filiformis*, and *Leersia hexandra*.

249 Shaw, G. D. and T. Passlow. 1970. Biology of the cotton seed bug (*Oxycarenus luctuosus*) (Montr. and Sign)). Queensland J. of Agr. and Anim. Sci., 27(3):329-335.

This is an account of field and laboratory investigations of the bionomics of *Oxycarenus luctuosus* on cotton in Queensland during 1963-66. Seventeen of 18 known alternative food plants, mostly common weeds, are malvaceous and one sterculiaceous. The major weed food plants were *Abutilon oxycarpum*, *Abutilon tubulosum*, *Anoda cristata*, *Hibiscus trionum*, *Malva parviflora*, *Pavonia hastata*, and *Sida rhombifolia*. *Abutilon micropetalum*, *Abutilon octocarpum*, *Hibiscus heterophyllus*, *Hibiscus tiliaceus*, *Malvastrum coromandelianum*, *Malvastrum spicatum*, *Sida cordifolia*, *Sida subspicata*, *Gossypium sturtii*, and *Brachychiton* sp. were also hosts.

250 Shaw, M. W. and J. H. White. 1969. Damage to barley by larvae of wheat bulb fly, *Leptohylemyia coarctata* (Fall.), associated with couch grass. Plant Pathol., 18(4):192.

Barley in a field of Morayshire, Scotland, that had been under barley also in the previous year was damaged over areas amounting to about 3/4 acre by larvae of *Hylemya (Leptohylemyia) coarctata* in May 1968. The field had been ploughed and sown within 2 weeks, and couch grass (*Agropyron repens*), from which the larvae had evidently originated, was growing in the infested areas, where it had impoverished the previous crop. In the same month, similar damage occurred

in a crop of spring barley, the fourth consecutive cereal crop in a field that had been ploughed late, in northeastern England. The damage extended over some 2 acres and coincided with infestation of *A. repens* in the previous year. Despite the application of a herbicide in October 1967, the larvae overwintered in *A. repens* and later migrated to the barley. *Agropyron repens* is likely to serve as an intermediate food plant for *H. coarctata* only in fields ploughed late.

251 Shelud'ko, A. D. 1976. The acacia soft scale. Zashchita Rastenii, No. 8, p. 42.

Parthenolecanium corni (Bch.) is widely distributed in the Ukraine, where it infests numerous plants, trees, and bushes (and occasionally grasses), especially plum, hazel (*Corylus avellana*), and false acacia (*Robinia pseudoacacia*). Eggs were numerous on soybean and watermelon, and more so than on the wild food plants mentioned. Populations on the two crops varied indirectly with the distance from the shelter belts and directly with the degree of infestation of the trees.

252 Smolarz, S. 1970. The biology of the mealy plum aphid *Hyalopterus pruni* (Geoff.) (Homoptera, Aphidodea). Biologia mszycy sliwowo-trzcinowej-*Hyalopterus pruni* (Geoff.) (Homoptera: Aphidoidea). Polskie Pismo Entomologiczne, 40(2):287-328.

Investigations were made in Poland in 1964-65, mostly in a field insectary at Skierniewice, on the biology of *H. pruni*. The primary hosts of this mealy plum aphid consist of varieties of *Prunus domestica* L., *Prunus insititia* Juslen, *Prunus cerasifera* Ehrh., and *Prunus spinosa* L. The secondary host, the common reed *Phragmites communis*, was its most important summer food plant.

253 Snow, J. W. and R. L. Burton. 1967. Seasonal occurrence of the *Heliothis* complex on *Desmodium purpureum* with observations on parasitism by *Cerdiochiles nigriceps*. J. Ga. Entomol. Soc., 2(2):47-53.

Observations in 1965 showed that *Desmodium purpureum*, a plant occurring commonly in southern Georgia, was a short-term but evidently important food plant for larvae of *Heliothis virescens* (F.) during the late summer. It also served to some degree as a food plant for *Heliothis zea* (Boddie).

254 Srvastava. R. P. and S. N. Pandey. 1968. A new cutworm pest of onion in India. Labdev. J. Sci. Technol., 6-B:54.

An *Agrotis* sp. was observed for the first time on onion in India in 1967 at Udaipur in the state of Rajasthan. Larvae were also found in large numbers beneath *Launea nudicolus*, growing in the infested onion field, and proved capable of completing their life cycle on this weed.

255 Stathopoolos, D. G. 1967. Studies on the identification and bio-ecology of *Aphis* spp., *Thrips tabaci* Hind., *Bemisia tabaci* Genn., *Empoasca* sp., and *Tetranychus urticae* Koch (*telarius*) (L.) cotton pests. II. Rep. Pl. Prot. Agri. Res. Stn. Thessaloniki, 3(1965):41-49.

In further studies on cotton pests near Thessaloniki in northern Greece in 1965, small numbers of *Myzus persicae* (Sulz) were found as well as the aphids previously recorded. *Bemisia tabaci* and *Tetranychus telarius* (L.) (*urticae* Koch) became a threat only in certain localities. The mite was found,

apparently for the first time, on the weeds *Verbascum undulatum* and *Verbascum thapsus*, even in winter. *Thrips tabaci* Lind. and *Empoasca* sp. were present in small numbers.

256 Stenseth, C. 1970. Investigations of aphids on plum. Underselser ovar bladlus paplomer. Meldinger fra Norges Landbruksh geskole, 49(18):21 pp.

The alates of the second generation of *Brachycaudus cardui* (L.), a pest of plum in Norway, were spring migrants, which colonized various Compositae and sometimes also plum.

257 Stevraki, H. and G. Stavrakis. 1968. Three injurious insects recorded on the heads of artichoke in Attica and the Peloponnese. Trois insects nuisibles signales aux capitulies d'ertichaut en Attique en Peloponnese. Annis Inst. Phytopath. Benaki (N.S.), 8(3)150-152.

Three insect pests of globe artichoke (*Cynara scolymus*) not previously known in Greece were found during research beginning in 1965 in the Attica and Peloponnese regions. The Tephritid *Terellia fuscicarnis* (Lw.) caused extensive damage in the heads, probably had two generations a year, and overwintered as third-instar larvae in the heads of *Cynara* or *Cirsium* left in the fields. The other new pests were the weevil *Larinus scolymi* (Ol.), which was often found together with *Larinus cynarae* (F.) on artichoke, and the Cosmopterygid *Pyroderces argyrogrammos* (Zell.). Nothing is yet known of their bionomics in Greece.

258 Subba Rao, P. V., A. V. Rangarajan, and A. Azeez Basha. 1976. Records of new host plants for some important crop pests in Tamil Nadu. Indian J. Entomol., 36(3):227-228.

In field studies on insect pests of pulse crops in Tamil Nadu, India, the following new food plant records were noted: *Heliothis armigera* (Hb.) on bitter gourd (*Momordiac charantia*), the ornamentals *Chrysanthemum* spp., marigold (*Tagetes indica*), and *Calendula officinalis*, and the weed *Laggera aurita*.

259 Summers, C. G., R. L. Coviello, W. E. Pendery, and R. W. Bushing. 1975. Sorghum midge pest management in the San Joaquin Valley. Calif. Agr., 29(9):4-5.

The sorghum midge (*Contarinia sorghicola* (Coq.)), which was first found in California in 1960, caused severe damage to developing ovaries of sorghum grown for seed throughout the southern San Joaquin Valley. The overwintered adults oviposited in *Sorghum halepense* in late May, and populations developed on this food plant until mid-August, when the later-planted sorghum crop was in flower.

260 Summers, C. G., R. L. Coviello, W. E. Pendery, and R. W. Bushing. 1976. Effect of sorghum midge on grain sorghum production in the San Joaquin Valley relative to date of planting and plant spacing. Hilgardia, 44(6):127-140.

Populations of the sorghum midge, *Contarinia sorghicola* (Dipt., Cecidomyiidae) are maintained at low levels in *Sorghum halepense*.

261 Svetlichnyi, N. E. 1977. Combined treatment of wheat. Zashchita Rastenii, No. 7, 23 (Ru) Kazizr, USSR.

In the Kokchetavsk region of Kazkhstan (USSR), *Loxostege sticticalis* (L.) is particularly injurous to wheat when it is sown in strips 100-200 m wide alternating with strips of fallow. In their supplementary feeding period, the moths

congregate on flowering weeds in the fallow strips and then move to the wheat in order to lay their eggs on it as well as on weeds. On one farm in 1976, 150 or more first-generation larvae/m^2 were present, and they spread to neighboring sunflower and potato.

262 Tahvanainen, J. O. E. and R. B. Root. 1970. The invasion and population outbreak of *Psylloides napi* (Coleoptera: Chrysomelidae) on yellow rocket (*Barbarea vulgaris*) in New York. Ann. Entomol. Soc. Amer., 63(5):1479-1480.

Two European flea-beetles, *Phyllotreta cruciferae* (Goeza) and *Phyllotreta striolata* (F.), feed extensively on *B. vulgaris*, but only in early spring, after which they move to cultivated crucifers and other weeds. *Psylloides napi* of European origin has become an important component of the *Barbarea* fauna. It was also found on *Brassica oleracea* and is a potential pest which could switch to cultivated crucifers as it becomes well established.

263 Takizawa, H. 1978. Notes on Taiwanese Chrysomelidae, I. Kontyu, 46(1):123-134 (En,3 fig.). Biological Research Center, Japan Tobacco and Salt Public Corp., Hatano, Kanagawa 257, Japan.

This paper on Chrysomelidae Galerucinae from Taiwan includes descriptions for 7 new species and a list of food plants observed by the author in Taiwan for 25 species. These include (mainly unspecified) wild and cultivated Cucurbitaceae and a species of *Rubus*.

264 Talhouk, A. A. 1977. Contribution to the knowledge of almond pests in East Mediterranean countries. VI. The sap-sucking pests. Zeitschrift fur Angewandte Entomologie, 83(3):248-257 (En, de, 12 ref., 2 fig.). Faculty of Agricultural Sciences, American University of Beirut, Lebanon.

In addition to the scale insect *Didesmococcus unifasciatus* (Arkh.), which was discussed in an earlier part, two leaf-curling aphids, *Brachycaudus amygdalinus* (Schout.) and *Brachycaudus helichrysi* (Kalt.), are important pests of almond in Lebanon. They have similar life histories and feed on the young leaves, causing stunted growth. Almond is their primary food plant. They feed on it for 12-14 weeks, overwintering on the trees as winter eggs, then migrate in June to *Polygonum aviculare* in the case of *B. amygdalinus* and to a variety of summer food plants including several species of Compositae and a few Leguminosae and Borraginaceae in the case of *B. helichrysi*.

265 Tamaki, G. 1975. Weeds in orchards as important alternate sources of green peach aphids in late spring. Environ. Entomol., 4(6):958-960.

As the population of *Myzus persicae* (Sulz.) declined after mid-May on peach trees in Washington, a population increased on the weeds *Chenopodium album* and *Amaranthus retroflexus* on the floor of the orchard. The same weed hosts inspected 1-6 miles away from peach orchards indicated a substantial decrease in the number of *M. persicae*. However, a survey in the fruit-growing area showed that apple orchards in proximity to peach orchards had a high population of *M. persicae* on the same weeds as in the peach orchards. Orchardgrass (*Dactylis glomerata*) used as a ground cover of the orchard greatly reduces the number of suitable alternative food plants of the orchard.

266 Tamaki, G., H. R. Moffitt, and J. E. Turner. 1975. The influence of perennial weeds on the abundance of redbacked cutworm (*Euxoa ochrogaster*: Lep., Noctuidae). Environ. Entomol., 4(2):274-276.

In weedy rows of asparagus infested with *Cirsium arvense* L. and *Convolvulus arvensis* L., the density of *E. ochrogaster* was 45/100 feet of row; in weedless rows it was 0.18/100 ft of row. In addition, field age played an important role in the ecology of the species. Younger fields which contained many weeds had more cutworms than older fields with few or no weeds.

267 Tapia, E. A. 1968. Sunflower, a new food plant for a known Homopterous pest. El girasol, nuevo hospedador para un homoptero conocido. Hoja Inf. Inst. Patol Veg., 25:2.

Bemisia tabaci (Gennadius), which attacks tomato in the Province of Tucuman and cassava (*Manihot esculenta*) in Misiones, in Argentina, has been found on the leaves of sunflower (*Helianthus annuus*) in Misiones. This appears to be the first record of the Aleyrodid on sunflower.

268 Taran, F. I. and V. I. Semenyuk. 1976. The protection of hops 'Polesskoe gold'. Zashchita Rastenii, No. 6, pp. 21-22.

Hops are grown widely in the Zhitomis region of the Ukraine, USSR, and need protection from various pests and diseases. Chemical control measures were undertaken to prevent the spread of *Phorodon humuli* (Schr.) from plums to hops, and to control *Psylliodes attenuata* (J. D. W. Koch) and *Sitona humeralis* Steph. Aphids and *Tetranychus urticae* Koch were the main pests later. The mite developed at first on weeds and later spread to hops.

269 Taylor, T. A. 1967. The bionomics of *Maruca testulalis* Gey. (Lepidoptera: Pyralidae), a major pest of cowpeas in Nigeria. J. W. Afr. Sci. Assoc., 12(2):111-129.

The seasonal biology of *M. testulalis*, an important pest of cultivated leguminous plants in tropical and subtropical regions, was investigated in the laboratory and in the field in relation to the cowpea crop over a period of 3 years in Ibadan, Nigeria. Generations of *M. testulalis* occur on a wide range of cultivated and wild leguminous plants, some of which are newly recorded as food plants.

270 Tenorio, E. C. and C. Manazes. 1970. Food plants of the froghoppers. Plantas hospedeiras des cigerrinhas. Congr. Nac. Bot. Joao Pessoa (PE)-11-18 January pp. a-k.

This is part of a series on sugarcane froghoppers in Brazil. In this article the Latin names of the food plants of Cercopids in Brazil are listed alphabetically under the headings Graminaceae, Cyperaceae, and other families, together with their Brazilian common names and the Cercopids that feed on them.

271 Thomas, H. 1969. The occurrence of *Aphis frangulae* sensu latiore on potato. Des Varkommen van *Aphis frangulae* Kaltenloach 1845 sensu latiore an Kartoffel. Arch. Pflschutz, 5(2):127-132.

The author considers that *A. frangulae* is the correct name of a complex of aphids in Central Europe which has been referred to as the complex of *A. gossypii* Glou. and *A. frangulae*. They do not differ morphologically, although there are slight color differences, and they are more or less interfertile. In principle, they almost all have *Rhamnus frangula* (*Frangula alnus*) as their primary (winter) food plant but they differ somewhat in their secondary (summer) food plants. The author recorded investigations in northern Germany, as a re-

sult of which he recognized six subspecies of *A. frangulae* distinguishable only by reference to details of color or bionomics. These compose the true *A. frangulae* with *R. frangula* as its primary food plant and various plants including *Epilobium angustifolium, Capsella bursa-pastoris,* and *Lysimachia vulgaris* as its secondary food plants, but not potato; *A. testacea* Thos. which migrates from *R. frangula* to *Capsella bursa-pastoris, Lysimachia vulgaris,* and some varieties of potato; *A. beccabungae* Koch which migrates from *R. frangula* to several varieties of potato, *Capsella bursa-pastoris, Lysimachia vulgaris,* and other plants; *A. capsellae* Kalt. which occurs on various plants including *Capsella bursa-pastoris* and rarely potato; *A. gossypii* which occurs on most of the summer food plants infested by the others and also on Cucurbitaceae, but not, at least in northern Germany, on potato. A new unnamed subspecies occurs in summer on *Capsella bursa-pastoris* and probably on potato.

272 Thomas, H. J. 1974. *Ischaemum aristatum* H. as an alternate host plant for the paddy gall midge *Pachydiplosis oryzae* Wood Mason (Cecidomyiidae: Diptera). Agricultural Research Journal of Kerala, 11(1):80.

Gall midge (*Pachydiplosis oryzae*), a pest of rice, was observed for the first time in India infesting *Ischaemum aristatum,* a graminaceous weed commonly found in rice fields, at Kerala during 1973.

273 Tsai, J. H. and O. H. Kirsch. 1978. Bionomics of *Haplaxius crudus* (Homoptera: Cixiidae). Environmental Entomol., 7(2):305-308.

Nymphs of *Haplaxius crudus* (Van D.) feed and live in the thatch layer and on roots of St. Augustine grass (*Stenotaphrum secundatum*), Bahia grass (*Paspalum notatum*), centipede grass (*Eremochloa ophiuroides*), Bermuda grass (*Cynodon dactylon*), para grass (*Panicum purpurascens*), yellow nutsedge (*Cyperus esculentus*), and other sedges. *H. crudos,* one of the most common insects on coconut palms in subtropical Florida and Jamaica, was studied in south Florida to evaluate it as a vector for transmitting the lethal yellowing disease (LY) causal organism. *S. secundatum* is its breeding host. Adults are very common on the underside of palm fronds, and feed on the phloem of leaves of coconut palms and grasses.

274 Valencia, V. L., T. C. Guerra, and F. Gutarra. 1976. The aphids (Homoptera-Aphididae) of the Mantaro Valley, food plants and natural enemies. Los afidos (Homoptera-Aphididae) del Valle Mantaro, plantas hospederas y enemigos naturales. Revista Peruana de Entomoligia, 18(1):90-97, Centro Internacional de la Papa, Lima, Peru.

An annotated list is presented of 25 species of aphids found on 50 species of food plants, both cultivated and wild, in the Mantaro Valley, Peru, situated at 3150-3400 m above sea level. The information given includes notes on food plants, locality records in Peru and, in some cases, on natural enemies. *Nasonovia ribisnigri* (Mosley), on a wild composite, and *Rhopalosiphoninus staphyleae* (Koch), on ivy, are recorded from Peru for the first time. Species reaching pest population levels were *Acyrthosiphon pisum* (Harris) on lucerne, *Brevicoryne brassicae* (L.) on cabbage, and *Sitobion avenae* (F.) (*Macrosiphum avenae*) and *Metopolophium dirhodum* (Wlk.) on oats, wheat, and rye. Although *Myzus persicae* (Sulz.), *Macrosiphum euphorbiae* (Thos.), *Aulacorthum solani* (Kalt.), *Aulacorthum circumflexum* (Buckt.) (*Neomyzus circumflexus*), and *Aphis gossypii* Glov. were present in the Mantaro Valley, they were not found on potato.

275 Vargas, C. H. 1970. Observations on the bionomics and natural enemies of the tomato moth, *Gnorimoschema absoluta* (Meyrick) (Lep. Gelechiidae). Observaciones sobre la biologia y enemigos naturales de la polilla del tomato, *Gnorimoschema absoluta* (Meyrick) (Lep. Galechiidae). Idesia, No. 1, pp. 75-110.

Investigations were carried out in 1967 in the Azapa Valley, Arica, Chile, and in the laboratory on the bionomics and natural enemies of *G. absoluta* (Meyr.). The moth is a serious pest of tomato in the Azapa Valley. In the field, both tomato and potato were attacked and infestation was observed on several weeds, including *Lycopersicum puberulum, Solanum nigrum,* and *Datura stramonium.*

276 Varis, A. L. 1972. The biology of *Lygus rugulipennis* Popp. (Het., Miridae) and the damage caused by this species to sugar beet. Annales Agriculturae Fenniae, 11:1-56.

Field and laboratory studies on the bionomics of *L. rugulipennis* and on the damage that it caused to sugarbeet were carried out in Finland in 1961-71. The Mirid preferred to oviposit on winter turnip rape rather than on red clover (*Trifolium pratense*) or bush bean (*Phaseolus vulgaris*). It also oviposited (in decreasing order of frequency) on *Tripleurospermum inodorum,* potato, winter turnip rape, swede, sugarbeet, *Artemisia vulgaris,* spring wheat, carrot, and pine. It was also tested on oats, barley, and *Urtica dioica.* Of the 15 plant species tested, *L. rugulipennis* adults were most numerous on *A. vulgaris, U. dioica,* and *T. inodorum.* These same species also carried large numbers of nymphs.

277 Varma, B. K., and T. R. Sharma. 1966. Studies on factors affecting population density and phase of desert locust in India. Pl. Prot. Bull., New Delhi, No. 18, pp. 9-24.

The outbreak of the desert locust (*Schistocerca gregaria* (Forsk.)) that began in India in 1959 reached its peak in 1962 and subsequently declined abruptly in 1963. However, unexpectedly large numbers of locusts in phase solitaria were present in the Bikaner district of Rajasthan in September-October 1963, and the meteorological and ecological factors that allowed populations to persist and to breed there for a few months were discussed. An abundance of green plants in the open steppe type of vegetation appeared to have played an important role. In particular, *Tribulus terrestris,* a plant that flourishes in sandy soils mixed with silt, a combination favorable for oviposition by locusts, and remains green longer than most of the accompanying vegetation, appears capable of supporting residual populations.

278 Vassilaina-Alexopoulou, P., P. A. Maurikis, and L. C. Argyriou. 1970. Preliminary results on the control of *Spodoptera littoralis.* Annales de l'Institut Phytopathologique Benaki, 9(4):322-330.

The bionomics, food plant range, and control of *S. littoralis* (Boisd.) were studied in Greece following a severe outbreak in 1969 on vegetables (especially potatoes), lucerne, and cotton in several parts of the Peloponnese. A list of food plants of *S. littoralis* in Greece was given, including cucumber, beans (*Phaseolus vulgaris*), leaf beet (*Beta vulgaris* var. *cicla*), clover, grafting slips of citrus, and various weeds.

279 Vasu, H. D. 1971. *Vetiveria zizanioides* (L.) Nash as a new host record for the white grub, *Holotrichia serrata* (F.) (Coleoptera: Melolonthinae). Indian J. Entomol., 32(3):272-273.

Larvae of *Lachnosterna* (*Holotrichia*) *serrata* were found among the roots of the grass *V. zizanioides* at New Delhi, India, in September 1968. This is the first record of the Scarabaeid on *V. zizanioides*. No larvae were discovered in searches of sugarcane growing a few meters away from the infested grass, although *L. serrata* has been recorded as a pest of sugarcane in India.

280 Velusamy, R., I. P. Janake, and T. R. Subramaniam. 1978. New record of host plants of the rice leaf roller *Cnaphalocrocis medinalis* Guen. (Pyraustidae: Lepidoptera). Madras Agri. J., 60(7):571.

The rice leaf roller *Cnaphalocrocis medinalis*, causing serious damage to the high-yielding rice varieties IR 8, IR 20, Jaya, Padma, and Karuna in Tamil Nadu, India, occurred also on wild species of rice, *Oryza perennis*, *Oryza eichingeri*, *Oryza subulata*, *Oryza latifolia*, *Oryza malampuzhaensis*, *Oryza alta*, and a hybrid of *Oryza perennis* and *Oryza eichingeri*.

281 Velusamy, R. and T. R. Subramaniam. 1976. Bionomics of the rice leaf roller *Cnaphalocrocis medinalis* Guen. (Pyralidae: Lepidoptera). Indian J. Entomol., 36(3):185-189, Dept. of Entomology, Tamil Nadu Agricultural University, Coimbatore, Tamil Nadu, India.

Field and laboratory studies were carried out in Tamil Nadu, India, on the bionomics of *C. medinalis*, a leaf-rolling pest of rice. The pyralid was recorded for the first time on watergrass (*Brachiaria mutica*) and *Echinochloa colonum*.

282 Verashchagina, V. V. 1966. The black cherry aphid *Myzus cerasi* Fabr. on sweet cherry and its control in Moldavia. Trudy moldav. nauchno-issled Inst. Sadov. Vinogr. Vined., 13:53-57.

Myzus cerasi is one of the most widespread and injurious aphids on fruit trees in Soviet Moldavia. Alatae appeared in the third generation and migration from the trees began while the apterae colonized the crowns of the trees and sometimes the fruits. The secondary food plants to which the alates migrated were unknown. When alates were released on *Galium schultesii* and *Veronica chamaedrys*, which are usually regarded as secondary food plants of *M. cerasi*, no progeny were obtained. No males were produced in the colonies on cherry itself. For the control of *M. cerasi*, therefore, wild plants in the vicinity of orchards should be destroyed.

283 Verma, A. 1976. Host plant records of sugarcane mite, *Schizotetranychus andropogoni* Hirst. Entomologists' Newsletter, 6(10):56.

Schizotetranychus andropogoni is a sporadic pest of sugarcane in India; in severe infestations, 2500-3000 webs/leaf were observed. It occurred on *Brachiaria ramosa*, *Cynodon dactylon*, *Sorghum halapense*, *Imperata cylindrica*, and *Andropogon* sp., which were reported as new food plants for *S. andropogoni* in the Lucknow area.

284 Vidano, C. 1967. Biological peculiarities of *Oecanthus pellucens* damaging vines. Annali. Fac. Soc. Agr. Univ. Studi. Torino, 4:37-50.

The tree cricket *Oecanthus pellucens* (Scop.) was found to damage grapevines in parts of northern Italy by making oviposition slits in the stems, and its habits were observed in 1963-67. The nymphs were normally found on grasses and herbaceous plants. Oviposition usually occurred in the erect stems of wild plants and also in the horizontal or slanting branches of *Rubus* and *Vitis*.

285 Wallis, R. L. and J. E. Turner. 1969. Burning weeds in drainage ditches to suppress populations of green peach aphids and incidence of beet western yellows disease in sugarbeets. J. Econ. Entomol., 62(2):307-309.

In field trials in 1965-1967, burning the weeds in drainage ditches over a square-mile area near sugarbeet fields during the winter reduced subsequent populations of *Myzus persicae* by 51-91% and the number of diseased plants by 77-84%. Yields were increased by 1.5 to 2.3 tons of roots/acre as a result of this treatment.

286 Werner, P. A. and R. Rioux. 1977. The biology of Canadian weeds. 24. *Agropyron repens* (L.) Beau. Canadian J. Plant Sci., 57(3):905-919.

Agropyron repens is an important weed of cultivated crops in all provinces of Canada and the Northwest Terriotry, and can be used as pasture and hay. This further paper in a series of Canadian weeds includes a review of the literature on insects that have been found in association with the grass. *Agropyron repens* served as an alternate host for the cereal leaf beetle, *Oulema melanopa* (L.), a pest of grain crops.

287 White, D. 1967. Some aphids occurring on endemic plants in central Australia, with special reference to *Aphis craccivora* Koch. J. Aust. Entomol. Soc., 6(1):74-76.

In August 1966, *A. craccivora* was found commonly on native plants of some 24 species, including 15 Chenopodiaceae and 9 leguminous species, in an area covering the north of South Australia and the south of the Northern Territory. It appeared that the source of the swarms of *A. craccivora* that attacked cultivated leguminous plants in eastern coastal districts of New South Wales in spring may be considerably greater in extent than was previously thought, since this aphid attacked plants that were common across the whole of western New South Wales. Native leguminous plants may also serve as sources or reservoirs of virus diseases transmitted by *A. craccivora*. *Rhopalosiphum maidis* (Fitch) was common on native and cultivated grasses in a district in the Northern Territory, and *Rhopalosiphum* (*Lipaphis*) *erysim* (Kalt.) on native crucifers in the north of South Australia.

288 Wilson, A. G. L. 1972. Distribution of pink bollworm, *Pectinophora gossypiella* (Saund.), in Australia and its status as a pest in the Ord irrigation area. J. Australian Inst. of Agri. Sci., 38(2):95-99.

P. gossypiella is of some economic importance on cotton in the Ord irrigation area of Australia. A high proportion of the full-fed larvae enter diapause in April, at the beginning of the dry season, and do not give rise to adults until August-October, when cotton is not available for oviposition and alternative food plants must be sought. Wild perennial malvaceous plants that flower in September-December are the most common.

289 Wood-Baker, C. S. 1972. A new food plant for *Macrosiphum* (*Sitobion*) *avenae* F. in Britain, with biometric data (Hem., Aphididae). Entomol. Monthly Mag., 107 (1286/88):185-187.

A colony of the aphid *Macrosiphum avenae*, which is normally graminicolous, with a wide range of host plant species, was found on the weed *Capsella bursa-pastoris* in southern England in November 1967. The strain was maintained indoors on *C. bursa-pastoris* and *Poa annua* until June 1968, and some differences in biometrical data are recorded, as compared with material collected elsewhere in England and in other countries. There are no discernible differences between examples that had been reared on *C. bursa-pastoris* and on *P. annua*.

290 Yuksel, M. 1968. Studies on the distribution, biology, ecology, and epidemiology of *Eurygaster integriceps* and the damage caused by it in south and southeastern Anatolia. YayinZir. Muc. Zir. Karant. Gen. Mudur. Turk Cumhur, 46:236 pp.

Studies were carried out in Turkey on *Eurygaster integriceps* Put., which caused considerable damage to cereal crops in the south and southeast of the country in some years. Some nymphs develop on wild graminaceous plants. A list is given of plants other than Graminaceae that are attacked by *E. integriceps* during and after the wheat harvest.

291 Zaitseva, E. G. 1970. The beet root aphid. Zashchita Rastenii, 15(12):23.

Investigations were made in the Kursk region of the Soviet Union in 1967-69 on the biology of the beet aphid (*Pemphigus fuscicornis* (Kodr)), which has been highly injurious in recent years. The aphid overwintered on wild Chenopodiaceae at the edges of beet fields, and the nymphs that developed in spring migrated to the beet crop. During April-September, 7 to 8 generations developed on wild Chenopodiaceae.

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ALOPECURUS-AEQUALIS RICE* CHOI. LEE. LA	059	1976
ALOPECURUS-GENICULATUS PHLEUM-PRATENSE D	047	1967
ALOPECURUS-PRATENSIS ALOPECURUS-GENICULA	047	1967
ALOPECURUS-PRATENSIS AVENA-FATUA BROMUS-	192	1969
ALSIKE-CLOVER PLANTAGO-MAJOR TARAXACUM-O	058	1970
ALSIKE-CLOVER TRIFOLIUM-HYBRIDUM* PERJU	209	1971
ALTAY.. ERKAM. GURSES. SITONA-CRINITUS PH	004	1972
ALTERNATHERA-ECHINATA SIDA-SP. TRIANTHEM	206	1968
ALTHAEA-ROSEA ABUTILON-FRUTICOSUM PAVONI	076	1971
ALTHAEA-ROSEA CHRYSANTHEMUM-MORIFOLIUM-V	133	1970
ALTHAEA-SPP. HIBISCUS-TRIONUM ABUTILON-A	092	1977
ALTHAEA-SPP.* HABIBI. BEMISIA-TABACI CO	122	1975
ALTHARA-RUGOSA* BULYGINSKAYA. BRYANTSEV	048	1969
ALTHARA-TAURINENSIS ALTHARA-RUGOSA* BUL	048	1969
ALTICA-CAERULESCENS MACRIMA-ARMATA WILLO	162	1977
AMARANTHACEAE COMPOSITAE KOCHIA-AMERICAN	163	1970
AMARANTHACEAE CONYZA-CANADENSIS PRIONOPS	232	1974
AMARANTHUS LYGUS-SPP. HELIOTHIS-ZEA SPOD	216	1975
AMARANTHUS-BLITOIDES AMARANTHUS-SPINOSUS	237	1971
AMARANTHUS-GRACILIS LUDWIGIA-LYSSOPIFOLI	035	1972
AMARANTHUS-PALMERI AMARANTHACEAE CONYZA-	232	1974
AMARANTHUS-RETROFLEXUS* DOCHKOVA. DIATA	078	1969
AMARANTHUS-RETROFLEXUS* GUENCHEV. AGROT	120	1968
AMARANTHUS-RETROFLEXUS HELIANTHUS-ANNUUS	137	1971
AMARANTHUS-RETROFLEXUS ATRIPLEX-CONFERTI	163	1970
AMARANTHUS-RETROFLEXUS ATRIPLEX-NITEUS C	219	1968
AMARANTHUS-RETROFLEXUS CIRSIUM-ARVENSE E	220	1974
AMARANTHUS-RETROFLEXUS ALHAGI-CAMELORUM	244	1973
AMARANTHUS-RETROFLEXUS APPLE ORCHARD-GRA	265	1975
AMARANTHUS-SP.* GRIGOROV. PEMPHIGUS-FUS	116	1977
AMARANTHUS-SPINOSUS LUCERNE* CHAUDHARY.	055	1977
AMARANTHUS-SPINOSUS ALTERNATHERA-ECHINAT	206	1968
AMARANTHUS-SPINOSUS AMBROSIA-ARTEMISIFOL	237	1971
AMARANTHUS-SPP. BELL-PEPPERS CHENOPODIUM	126	1976
AMARANTHUS-VIRIDIS AMARANTHUS-SPINOSUS L	055	1977

AMARANTHUS-VIRIDIS CANNABIS-SATIVA CHENO	061	1972
AMBROSIA-ARTEMISIOIDES POTATO SOLANUM-NI	031	1969
AMBROSIA-ARTEMISIFOLIA ARACHIS-HYPOGAEA	237	1971
AMBROSIA-SP. SUGARBEET BROMEGRASS ALFALF	123	1973
AMBROSIA-SPP.* HATCHETT. DAUGHERTY. ROB	127	1975
AMBROSIA-TRIFIDA CAMPYLENCHIA-LATIPES AS	218	1978
AMETASTEGIA-GLABRATA ORCHARDS WEEDS* KA	145	1971
AMETASTEGIA-GLABRATA ORCHARDS RUMEX-OBTU	180	1968
AMPHIPYRA-LIVIDA EUGRAPHE-SIGMA LACANOBI	198	1976
AMSINCKIA-INTERMEDIA BETA-VULGARIS-VAR.-	164	1972
ANANTHAKRISHNAN. KANDASAMY. BALIOTHRIPS-	005	1977
ANANTHAKRISHNAN. THANGAVELU. HAPLOTHRIPS	006	1976
ANANTHAKRISHNAN. THIRUMALAI. THRIPS CHIR	007	1977
ANDERSON. HAPLODIPLOSIS-MARGINATA BARLEY	008	1968
ANDROPOGON-BICORNIS* METCALFE. SACCHARO	188	1968
ANDROPOGON-GLOMERATUS ANDROPOGON-BICORNI	188	1968
ANDROPOGON-SP.* VERMA. SCHIZOTETRANYCHU	283	1976
ANGELES. OAKLEY. OSORIO. APHIDS POTATO C	009	1969
ANGELOVA. PANONYCHUS-ULMI* ANGELOVA. PA	010	1978
ANUDA-CRISTATA HIBISCUS-TRIONUM.MALVA-PA	249	1970
ANOECIA-CORNI MAIZE ALOPECURUS-PRATENSIS	192	1969
ANONYMOUS. AGROTIS-IPSILON AGROTIS-SEGET	018	1977
ANONYMOUS. CENOPALPUS-PULCHER CENOPALPUS	020	1967
ANONYMOUS. CEREALS OPOMYZA-FLORUM WHEAT	015	1969
ANONYMOUS. CHLOROPS-PUMILIONIS BARLEY WH	013	1976
ANONYMOUS. COCOA EMPOASCA-SPP. AFROCCIDE	012	1969
ANONYMOUS. FRANKLINIELLA-BREVICAULIS MAI	011	1978
ANONYMOUS. NILAPARVATA-LUGENS WEEDS* AN	014	1969
ANONYMOUS. RICE WEEDS* ANONYMOUS. RICE	017	1972
ANONYMOUS. THRIPS-ORYZAE BALIOTHRIPS-BIF	019	1976
ANONYMOUS. ZULIA-ENTRERIANA PASTURES WIL	016	1970
ANOXIA-PILOSA ORCHARDS VINEYARDS MEADOWS	130	1978
ANTHEMIS-ARVENSIS AMARANTHUS-RETROFLEXUS	220	1974
ANTHONOMUS-GRANDIS COTTON QUERCUS-HAVARD	236	1970
ANTS AMARANTHUS-RETROFLEXUS ATRIPLEX-NIT	219	1968
ANTS PHYLLANTHUS-FLORIBUNDA COLA-CARICIF	087	1973
ANURAPHIS-(DYSAPHIS)-DEVECTA ANURAPHIS-P	115	1972
ANURAPHIS-CATONII PEAR TUSSILAGO-FARFARA	156	1972
ANURAPHIS-FARFARAE ANURAPHIS-PYRILASERI	156	1972
ANURAPHIS-PLANTAGINEA PLANTAGO* GRIGORO	115	1972
ANURAPHIS-PYRILASERI ANURAPHIS-SUBTERRAN	156	1972
ANURAPHIS-SUBTERRANEA ANURAPHIS-CATONII	156	1972
APERA-SPICA-VENTI SCLERANTHUS-ANNUUS POL	118	1970
APHANISTICUS-PENINSULA RICE IMPERATA-CYL	181	1977
APHIDS POTATO CAPSICUM MYZUS-PERSICAE MA	009	1969
APHIS-CRACCIVORA THERIOAPHIS-TRIFOLII LE	244	1973
APHIS-CRACCIVORA CHENOPODIACEAE RESERVOI	287	1967
APHIS-FABAE AULACORTHUM-SOLANI MACROSIPH	138	1971
APHIS-FABAE RHOPALOSIPHONINUS-STAPHYLAE	128	1965
APHIS-FRANGULAE-SENSU-LATIORE POTATO APH	271	1969
APHIS-GOSSYPII VEGETABLE-CROPS POTATOES	133	1970
APHIS-GOSSYPII COTTON ANTS AMARANTHUS-RE	219	1968
APHIS-GOSSYPII RHAMNUS-FRANGULA EPILOBIU	271	1969
APHIS-GOSSYPII POTATO* VALENCIA. GUERRA	274	1976
APHIS-SPP. THRIPS-TABACI EMPOASCA-SP. TE	255	1967
APHIS-SPP. VEGETABLES WEEDS BEANS CUCUMB	108	1972

APHRODES-BICINCTA STRAWBERRY RED-CLOVER 058 1970
APICALIS* CHEN. HOPPERS RICE NEPHOTETTI 056 1969
APION-AESTIMATUM APION-AESTIVUM APION-AP 222 1969
APION-AESTIVUM APION-APRICANS APION-ASSI 222 1969
APION-APRICANS APION-TRIFOLII APION-SENI 209 1971
APION-APRICANS APION-ASSIMILE APION-CERD 222 1969
APION-ASSIMILE APION-DISSIMILE APION-DIC 209 1971
APION-ASSIMILE APION-CERDO APION-ERVI AP 222 1969
APION-CERDO APION-ERVI APION-FACETUM API 222 1969
APION-DICHROUM APION-NIGRITARSE APION-VA 209 1971
APION-DISSIMILE APION-DICHROUM APION-NIG 209 1971
APION-ERVI APION-FACETUM APION-FLAVIPES 222 1969
APION-FACETUM APION-FLAVIPES APION-LOTI 222 1969
APION-FILIROSTRE MICCOTROGUS-PICIROSTRIS 209 1971
APION-FLAVIPES APION-LOTI APION-MELILOTI 222 1969
APION-LOTI APION-MELILOTI APION-SENICULU 222 1969
APION-MELILOTI APION-SENICULUS APION-SPE 222 1969
APION-NIGRITARSE APION-VARIPES APION-FIL 209 1971
APION-SENICULUS APION-ASSIMILE APION-DIS 209 1971
APION-SENICULUS APION-SPENSEI APION-SUBU 222 1969
APION-SPENSEI APION-SUBULATUM APION-TENU 222 1969
APION-SUBULATUM APION-TENUE APION-VICIAE 222 1969
APION-TENUE APION-VICIAE APION-VIRENS LA 222 1969
APION-TRIFOLII APION-SENICULUS APION-ASS 209 1971
APION-VARIPES APION-FILIROSTRE MICCOTRUG 209 1971
APION-VICIAE APION-VIRENS LATHYRUS-PRATE 222 1969
APION-VIRENS LATHYRUS-PRATENSIS LOTUS-CO 222 1969
APOCYNUM-CANNABINUM ABUTILON-THEOPHRASTI 137 1971
APPLE AMETASTEGIA-GLABRATA ORCHARDS WEED 145 1971
APPLE ANURAPHIS-(DYSAPHIS)-DEVECTA ANURA 115 1972
APPLE GALIUM-APARINE* LOWE. MACROSIPHUM 170 1969
APPLE ORCHARD-GRASS DACTYLIS-GLOMERATA* 265 1975
APPLE ORCHARDS* MEIRLEIRE. WILD-PLANTS 185 1968
APPLE PEAR CRATAEGUS* DOMENICHINI. PSYL 079 1968
APPLE QUINCE CRATAEGUS-SPP. STONE-FRUITS 020 1967
APPLE* CORDINGLEY. DANTHANARAYANA. CAPE 064 1976
APPLE* ELSHAFIE. NYSIUS-VINITOR PORTULA 089 1976
APRICOTS PHRAGMITES-COMMUNIS* EL-KADAY. 088 1971
ARACHIS-HYPOGAEA* BONGERS. ONUCOPELTUS- 038 1969
ARACHIS-HYPOGAEA INDIGOFERA-HIRSUTA PHAS 223 1977
ARACHIS-HYPOGAEA CHENOPODIUM-AMARANTICOL 237 1971
ARCTOSTAPHYLUS-UVA-URSI WILD* GALLEGO. 101 1975
ARGYRIOU. SPODOPTERA-LITTORALIS VEGETABL 278 1970
ARMORACIA-LAPATHIFOLIA BROAD-BEAN VICIA- 196 1970
ARMYWORM PHRAGMITES-COMMUNIS* BIBOLINI. 036 1970
ARTEMISIA-VULGARIS WHEAT CARROT PINE OAT 276 1972
ARTHOFER. VINEYARDS PANONYCHUS-ULMI TETR 021 1976
ARTICHOKE CYNARA THISTLE CLOVER NETTLE L 124 1973
ARTICHOKE CYNARA-SCOLYMUS* ROBERT. CAPI 231 1969
ARTICHOKE CYNARA-SCOLYMUS TERELLIA-FUSCI 257 1968
ASCLEPIAS-SYRIACA HELIANTHUS-ANNUUS ARAC 038 1969
ASPARAGUS CIRSIUM-ARVENSE CONVOLVULUS-AR 266 1975
ASPERGILLUS-CANDIDUS* KILIC. EURYGASTER 152 1967
ASPODELINE-ISTHOMOCARPA ASTRAGALUS-SPP.* 083 1974
ASTER-SAGITTIFOLIUS SOLIDAGO-ULMFOLIA SO 218 1978
ASTER-TUBINELLUS POLYGALA-SP. COREOPSIS- 218 1978

ASTRAGALUS-SP.* MANGLITZ. GORZ. STEVENS	179	1971
ASTRAGALUS-SPP.* DURAN. AELIA-ROSTRATA	083	1974
ATAK. TETRANYCHUS-URTICAE THRIPS-SPP. AP	108	1972
ATHERIGONA-APPROXIMATA ATHERIGONA-PULLA	226	1977
ATHERIGONA-ERIOCHLOAE* REDDY. DAVIES. C	226	1977
ATHERIGONA-FALCATA ECHINOCHLOA-CRUS-GALL	226	1977
ATHERIGONA-ORYZAE DIGITARIA-ADSCENDENS A	226	1977
ATHERIGONA-PULLA PANICUM-PSILOPODIUM ATH	226	1977
ATHERIGONA-SOCCATA SORGHUM* GRANADOS. D	114	1972
ATHERIGONA-SOCCATA SORGHUM MAIZE PENNISE	226	1977
ATHERIGONA-VARIA-VAR.-SOCCATA SORGHUM SO	193	1969
ATRIPLEX-CONFERTIFOLIA ATRIPLEX-HASTATA	163	1970
ATRIPLEX-HASTATA ATRIPLEX-HORTENSIS ATRI	163	1970
ATRIPLEX-HORTENSIS ATRIPLEX-ROSEA BASSIA	163	1970
ATRIPLEX-HORTENSIS CHENOPODIUM-ALBUM* M	175	1969
ATRIPLEX-NITEUS CAPSELLA-BURSA-PASTORIS	219	1968
ATRIPLEX-NITEUS ANTHEMIS-ARVENSIS AMARAN	220	1974
ATRIPLEX-ROSEA BASSIA-HYSSOPIFOLIA CHENO	163	1970
ATRIPLEX-SP. AMARANTHUS-SP.* GRIGOROV.	116	1977
ATTIA. HYALOPTERUS-PRUNI PEACH APRICOTS	088	1971
AULACORTHUM-CIRCUMFLEXUM NEOMYZUS-CIRCUM	274	1976
AULACORTHUM-SOLANI APHIS-FABAE RHOPALOSI	128	1965
AULACORTHUM-SOLANI MACROSIPHUM-EUPHORBIA	138	1971
AULACORTHUM-SOLANI FILIPENDULA-ULMARIA G	196	1970
AULACORTHUM-SOLANI AULACORTHUM-CIRCUMFLE	274	1976
AUTOGRAPHA-(PHYTOMETRA)-CIRCUMFLEXA BEAN	003	1971
AUTOGRAPHA-GAMMA PINUS CONVOLVULUS-SEPIU	172	1972
AVENA-FATUA BROMUS-ARVENSIS BROMUS-MOLLI	192	1969
AVENA-FATUA FLAX EGYPTIAN-CLOVER TRIFOLI	148	1972
AVENA-FATUA POA-ANNUA* MARKKULA. ROUKKA	182	1972
AVENA-SP. TRITICUM-SP. BROMUS-UNIOLOIDES	170	1969
AVENA-SPP. SETARIA-SPP.* FURTUNOV. HAPL	100	1976
AWADALLAH. CNEPHASIA-PUMICANA CRUCIFERS	148	1972
AXONOPUS-SCOPARIUS CYMBOPOGON-NARDUS TRI	217	1970
AZEEZ-BASHA. PULSE HELIOTHIS-ARMIGERA MO	258	1976
AZIZ. SPATHOSTERNUM-PRASINIFERUM ECHINOC	134	1976
BAILEY. MELANOPLUS-BIVITTATUS MELANOPLUS	022	1976
BALARAMMENON. CANTHIUM-DICOCCUM COCCUS-V	082	1969
BALAKIN. AUTOGRAPHA-GAMMA PINUS CONVOLVU	172	1972
BALEVSKI. KONTEV. PENTHALEUS-MAJOR WHEAT	023	1969
BALIOTHRIPS-BIFORMIS MAIZE BORRERIA-HISP	005	1977
BALIOTHRIPS-BIFORMIS LEERSIA-JAPONICA GR	019	1976
BALIOTHRIPS-BIFORMIS* MAMMEN. VASUDEVAN	176	1977
BALIOTHRIPS-HOLORPHNUS* ANANTHAKRISHNAN	005	1977
BALIOTHRIPS-UZEL MAIZE WEED-HOSTS ECHINO	005	1977
BANANA CLERODENDRON FABACEAE* ANONYMOUS	011	1978
BANHAM. PRUNUS-EMARGINATA PRUNUS-VIRGINI	024	1971
BARAN. BREVICORYNE-BRASSICAE CRUCIFERS*	025	1970
BARBAREA-INTERMEDIA BARBAREA-STRICTA BRA	097	1977
BARBAREA-STRICTA BRASSICA-NEPUS COCHLEAR	097	1977
BARBAREA-VULGARIS* . FINCH. ACKLEY. ERIOI	097	1977
BARBAREA-VULGARIS CRUCIFER* ROOT. TAHVA	234	1969
BARBAREA-VULGARIS PHYLLOTRETA-CRUCIFERAE	262	1970
BARBULESCU. CIRPHIS-UNIPUNCTA MYTHIMNA-(	026	1972
BARDNER. MATHENGE. PHYTOMETRA-ORICHALCEA	027	1974
BARLERIA-PRIONITIS* LAL. MUKHARJI. LEPT	161	1975

BARLEY AGROPYRON-INTERMEDIUM MAIZE* BRA 044 1967
BARLEY AGROPYRON-REPENS* FABER, HAPLODI 091 1970
BARLEY APPLE GALIUM-APARINE* LOWE, MACR 170 1969
BARLEY AVENA-FATUA FLAX EGYPTIAN-CLOVER 148 1972
BARLEY CYNODON-DACTYLON IMPERATA-CYLINDR 132 1969
BARLEY EURYGASTER-MAURA QUERCUS-SPP. PIN 083 1974
BARLEY GRASSES* BUTANI, CHILO-INFUSCATE 050 1969
BARLEY HYLEMYA-(LEPTOHYLEMYIA)-CUARCTATA 250 1969
BARLEY OATS AVENA-FATUA POA-ANNUA* MARK 182 1972
BARLEY OATS GRASSES* DUSEK, CEREAL HYLE 085 1969
BARLEY OATS SORGHUM MILLET AGROPYRON BRO 158 1973
BARLEY RYE OATS MAIZE MILLET RICE AGROPY 199 1968
BARLEY SORGHUM MAIZE GRASSES* MIKHAILOV 189 1970
BARLEY SORGHUM LUCERNE AMARANTHUS LYGUS- 216 1975
BARLEY SORGHUM-SUDANENSE SORGHUM-HALEPEN 075 1969
BARLEY TREES SHRUBS GRASSES HERBACEOUS-P 106 1978
BARLEY URTICA-DIOICA* VARIS, LYGUS-RUGU 276 1972
BARLEY WHEAT CEREALS WILD-GRASSES* ANDE 008 1968
BARLEY WHEAT CITRUS-SP. CONVOLVULUS-ARVE 150 1969
BARLEY WHEAT OATS LAWN-GRASSES RYE CORN 123 1973
BARLEY WHEAT RYE WILD-GRASSES* ANONYMOU 013 1976
BARLEY* ANONYMOUS, CEREALS OPOMYZA-FLOR 015 1969
BARLEY* BARNETT, MOREHEAD, DAVIS, JOOS, 029 1976
BARLEY* IQBAL, AZIZ, SPATHOSTERNUM-PRAS 134 1976
BARNES, NYSIUS-RAPHANUS SISYMBRIUM-IRIO 028 1970
BARNETT, MOREHEAD, DAVIS, JOOS, BEARDEN, 029 1976
BARRY, HOUSER, DECTUS-TEXANUS SOYBEAN AM 127 1975
BASELLA-ALBA GANTHORA DIOSCOREA-ESCULENT 243 1974
BASSIA-HYSSOPIFOLIA CHENOPODIUM-ALBUM HA 163 1970
BATRA, VEGETABLES CEREALS PSYLLIODES-BRE 030 1969
BAUTISTA, VITEUS-VITIFOLIAE PHYLLOXERA-V 239 1969
BEANS CEREALS WEED-FOOD-PLANTS* ALIMDZH 003 1971
BEANS CUCUMBER SQUASH* GOKSU, ATAK, TET 108 1972
BEANS PHASEOLUS-VULGARIS WILD-PLANTS* G 102 1972
BEANS PHASEOLUS-VULGARIS BEET BETA-VULGA 278 1970
BEARDEN, BERLOWITZ, PEAK EUSCHISTUS-CONS 029 1976
BEAUVERIA-BASSIANA* CIOCHIA, MUSTATEA, 063 1977
BEAUVERIA-BASSIANA ASPERGILLUS-CANDIDUS* 152 1967
BEET BETA-VULGARIS-VAR.-CICLA CLOVER CIT 278 1970
BEET CHENOPODIACEOUS-WEEDS COMPOSITES* 103 1975
BEET LUCERNE SUNFLOWER HELIANTHUS-ANNUUS 078 1969
BEET MAIZE VEGETABLE-CROPS WEED* NIKOLO 202 1971
BEET SENECIO-VULGARIS VERONICA-PERSICA S 138 1971
BEET SPINACH ATRIPLEX-HORTENSIS CHENOPOD 175 1969
BEET* MAMONTOVA-SOLUKHA, HAPANOVA, PEMP 178 1966
BEET* ZAITSEVA, PEMPHIGUS-FUSCICORNIS C 291 1970
BEETS SUGARBEETS* GOLIKOV, KOSMACHEVSKI 110 1972
BEINGOLEA, ORTHEZIA-OLIVICOLA AMBROSIA-A 031 1969
BELL-PEPPERS BUSH-BEANS* MARTIN, LINGRE 183 1976
BELL-PEPPERS CHENOPODIUM-SPP, SORGHUM MA 126 1976
BELL-PEPPERS GRAIN-SORGHUM CORN STRING-B 113 1970
BEMISIA-TABACI COTTON GROUNDNUTS KENAF H 102 1972
BEMISIA-TABACI COTTON CONVOLVULUS ALTHAE 122 1975
BEMISIA-TABACI TETRANYCHUS-TELARIUS VERB 255 1967
BEMISIA-TABACI TOMATO CASSAVA MANIHOT-ES 267 1968
BEN-SAAD, BISHOP, WEEDS POA-BULBOSA STEL 032 1969

BERBAGALLO. CALOCORIS-(CLOSTEROTOMUS)-TR 033 1970
BERIM. TATARINTSEVA. HOPS HYDRAECIA-MICA 034 1976
BERLOWITZ. PEAR EUSCHISTUS-CONSPERSUS LE 029 1976
BERRY-CROPS GRAPHIPHORA-AUGUR TRIPAENA-A 198 1976
BESCO. LEVI. OSORES. MOCIS-LATIPES SUGAR 065 1973
BETA-VULGARIS-VAR.-CIRCLA BRASSICA-NIGRA 164 1972
BETA-VULGARIS-VAR.-CICLA CLOVER CITRUS W 278 1970
BETAE-DOANE POPULUS CHENOPODIACEOUS-WEED 177 1975
BETHE. VIJZELMAN. FRERIKS. NAPOMYZA CHIC 242 1975
BHAT. BALARAMMENON. CANTHIUM-DICOCCUM CO 082 1969
BHAT. SHAMANNA. PLANOCOCCUS-LILACINUS CO 035 1972
BIBOLINI. MYTHIMNA-UNIPUNCTA MAIZE OATS 036 1970
BIDENS-PILOSA* BARDNER. MATHENGE. PHYTO 027 1974
BIRDSFOOT-TREFOIL LOTUS-CORNICULATUS TIM 026 1972
BISHOP. WEEDS POA-BULBOSA STELLARIA-MEDI 032 1969
BITTERSWEET SOLANUM-DULCAMARA SOLANUM-CA 039 1970
BLACK-CURRANT RASPBERRY* MUSICH. BERRY- 198 1976
BLACKEYED-PEAS* GRAHAM. ROBERTSON. HELI 113 1970
BLISSUS-LEUCOPTERUS BRACHIARIA-SP. GRAMI 229 1976
BLUMEA-LACERA GRAMINEAE-GREWIA-HIRSUTA B 161 1975
BODHADE. DYSDERCUS-CINGULATUS CHROZOPHOR 139 1974
BODHADE. DYSDERCUS-CINGULATUS CHROZOPHOR 140 1975
BOGARADA. OSTROVSKII. STENOCARUS-FULIGIN 037 1967
BOGAWAT. AGROTIS-SEGETUM AMARANTHUS-SPIN 206 1968
BOGAWAT. PAPILIO-DEMOLEUS PSORALEA-CORYL 205 1969
BOLING. GRAHAM. PSALLUS-(PSEUDATOMOSCELI 247 1969
BONGERS. LEPTINOTARSA-DECEMLINEATA SOLAN 039 1970
BONGERS. ONOCOPELTUS-FASCIATUS ASCLEPIAS 038 1969
BORLE. BODHADE. DYSDERCUS-CINGULATUS CHR 139 1974
BORLE. BODHADE. DYSDERCUS-CINGULATUS CHR 140 1975
BORRAGINACEAE* TALHOUK. DIDESMOCOCCUS-U 264 1977
BORRERIA-HISPIDA BALIOTHRIPS-HOLORPHNUS* 005 1977
BOTHYNODERES-PUNCTIVENTRIS SUGARBEET BEA 063 1977
BOTHYNUS-GIBBOSUS FIELD-CROPS HELIANTHUS 232 1974
BOUCHERY. PUTZ. PHYLLOCOPTES-(ERIOPHYES) 040 1972
BOUCHET. DAGNEAUD. SITUCIPLOSIS-MOSELLAN 041 1969
BOURNIER. CALIOTHRIPS-HELINI COTTON COMM 043 1968
BOURNIER. NECTARINES TAENIOTHRIPS-VULGAT 042 1970
BOXIOPSIS-MADAGASCARIENSIS CACAO FLEMING 072 1974
BRACHIARIA-DISTACHYA CYNODON-DACTYLON EC 096 1968
BRACHIARIA-LATA* MORGAN. ABU. RICE DIOP 195 1973
BRACHIARIA-MUTICA* PATEL. CHOUDARY. KHA 208 1975
BRACHIARIA-MUTICA ECHINOCHLOA-COLONUM* 281 1976
BRACHIARIA-RAMOSA CYNODON-DACTYLON SORGH 283 1976
BRACHIARIA-REPTANS ELEUSINE-INDICA ATHER 114 1972
BRACHIARIA-SP. GRAMINACEOUS-SPECIES* RE 229 1976
BRACHYCAUDUS-AMYGDALINUS BRACHYCAUDUS-HE 264 1977
BRACHYCAUDUS-CARDUI COMPOSITAE* STENSET 256 1970
BRACHYCAUDUS-HELICHRYSI ALMOND POLYGONUM 264 1977
BRACHYCHITON-SP.* SHAW. PASSLOW. OXYCAR 249 1970
BRAMBLES PEAR* ARTHOFER. VINEYARDS PANO 021 1976
BRANSON. ORTMAN. DIABROTICA-LONGICORNIS 044 1967
BRASSICA-CAMPESTRIS PHYLLOTRETA-CRUCIFER 049 1972
BRASSICA-KABER MELILOTUS-INDICA WITHANIA 061 1972
BRASSICA-NAPUS BRASSICA-CAMPESTRIS PHYLL 049 1972
BRASSICA-NAPUS RADISH MEDICAGO-CILIARIS 148 1972

BRASSICA-NEPUS CUCHLEARIA-OFFICINALIS BR 097 1977
BRASSICA-NIGRA CAPSELLA-BURSA-PASTORIS C 164 1972
BRASSICA-OLERACEA-VAR.-CAULORAPA BRASSIC 197 1969
BRASSICA-OLERACEA-VAR.-GANGYBIDES COSMOS 197 1969
BRASSICA-OLERACEA* TAHVANAINEN. ROOT. P 262 1970
BRASSICA-RAPA ERYSIMUM-AUREUM CUCHLERIA- 097 1977
BRASSICA-SP.* CHIYKOVSKI. APHRODES-BICI 058 1970
BRASSICA-SPP. BARLEY* BARNETT. MOREHEAD 029 1976
BREVICORYNE-BRASSICAE CRUCIFERS* BARAN. 025 1970
BREVICORYNE-BRASSICAE CABBAGE SITOBION-A 274 1976
BREVO-VIANA. SCROBIPALPULA-ABSOLUTA POTA 240 1969
BRINJAL PHASEOLUS-MUNGO-RADIATUS SANNHEM 030 1969
BRINJAL SOLANUM-MELONGENA TOMATO SOLANUM 070 1971
BRINJAL TOMATO SPINACH STRAWBERRY WEEDS 162 1977
BROAD-BEAN VICIA-FABA MYOSOTIS-PALUSTRIS 196 1970
BROAD-BEANS VICIA-FABA FENUGREEK TRIGONE 132 1969
BROADBEAN VICIA-FABA CABBAGE CAULIFLOWER 148 1972
BROCCOLI BRUSSELS-SPROUTS CABBAGE CAULIF 126 1976
BROCCOLI MUSTARD* FEENY. PAAVWE. DEMONG 095 1970
BROMEGRASS ALFALFA TARAXACUM-OFFICINALE 123 1973
BROMUS CYNODON SETARIA* KONTEV. ORIA-MU 158 1973
BROMUS-ARVENSIS BROMUS-MOLLIS FESTUCA-SP 192 1969
BROMUS-INERMIS NARDUS-STRICTA DESCHAMPSI 047 1967
BROMUS-MOLLIS FESTUCA-SPP. HORDEUM-MURIN 192 1969
BROMUS-UNIOLOIDES GRASSES WHEAT OATS BAR 170 1969
BROVDII. COMPOSITAE LABIATAE CHENOPODIAC 045 1968
BROVDII. GONIOCTENA-FURNICATA PHYTODECTA 046 1976
BRUSSELS-SPROUTS CABBAGE SWEDE RAPHANUS- 097 1977
BRUSSELS-SPROUTS CABBAGE CAULIFLOWER CHE 126 1976
BRYANTSEVA. PECTINOPHORA-MALVELLA PEXICO 048 1969
BUHL. ACERIA-(ERIOPHYTES)-TENUIS GRASSES 047 1967
BULYGINSKAYA. BRYANTSEVA. PECTINOPHORA-M 048 1969
BURGESS. RAPE BRASSICA-NAPUS BRASSICA-CA 049 1972
BURTON. DESMODIUM-PURPUREUM CERDIOCHILES 253 1967
BUSH-BEAN PHASEOLUS-VULGARIS TRIPLEUROSP 276 1972
BUSH-BEANS* MARTIN. LINGREN. GREENE. TR 183 1976
BUSHING. CONTARINIA-SORGHICOLA SORGHUM S 259 1975
BUSHING. CONTARINIA-SORGHICOLA SORGHUM-H 260 1976
BUTANI. CHILO-INFUSCATELLUS SUGARCANE MA 050 1969
BYRSOCRIPTA-GALLARUM ANOECIA-CORNI MAIZE 192 1969
CABBAGE CAULIFLOWER RAPE-MUSTARD RADISH 030 1969
CABBAGE CAULIFLOWER CHENOPODIUM-SPP. HEL 126 1976
CABBAGE CAULIFLOWER RAPE BRASSICA-NAPUS 148 1972
CABBAGE COLLARDS SOYBEANS PEANUTS TOMATO 183 1976
CABBAGE ONION CLOVER TRIFOLIUM-REPENS TO 120 1968
CABBAGE SITOBION-AVENAE MACROSIPHUM-AVEN 274 1976
CABBAGE SWEDE RAPHANUS-RAPHANISTRUM CAPS 097 1977
CABBAGE TOMATOES CUCUMBER MELON WEED* M 190 1968
CACALIA-MUHLENBERGII ASTER-SAGITTIFOLIUS 218 1978
CACAO FLEMINGIA-CONGESTA SHADE-TREE UREN 072 1974
CACAO* ANONYMOUS. COCOA EMPOASCA-SPP. A 012 1969
CADEILHAN-GIRAUDET. DIPAROPSIS-TEPHRAGRA 051 1968
CALADIUM-HORTULANUM CHENOPODIUM-BOTRYS C 237 1971
CALENDULA-OFFICINALIS* MUNSHI. MECCI. L 197 1969
CALENDULA-OFFICINALIS LAGGERA-AURITA* S 258 1976
CALIOTHRIPS-HELINI COTTON COMMICARPUS-CO 043 1968

CALLICARPA-JAPONICA HIBISCUS-SYRIACUS CE 133 1970
CALOCORIS-(CLOSTEROTOMUS)-TRIVIALIS OLIV 033 1970
CAMOMILE NAPOMYZA-CICHORII CICHORIUM-SP. 242 1975
CAMPYLENCHIA-LATIPES ASTER-TUBINELLUS PO 218 1978
CANNABIS-SATIVA CHENOPODIUM-MURALE CHENO 061 1972
CANTHIUM-DICOCCUM COCCUS-VIRIDIS* D'SAU 082 1969
CAPE-GOOSEBERRY SOLANUM-MAMMOSUM SOLANUM 067 1969
CAPEWEED-(ARCTOTHECA-CALENDULA) EPIPHYAE 064 1976
CAPITOPHORUS-HORNI CIRSIUM CARDUUS ARTIC 231 1969
CAPSELLA-BURSA-PASTORIS HOLOSTEUM-UMBELL 032 1969
CAPSELLA-BURSA-PASTORIS ERIGERON-CANADEN 058 1970
CAPSELLA-BURSA-PASTORIS SISYMBRIUM-OFFIC 097 1977
CAPSELLA-BURSA-PASTORIS GALIUM-APARINE L 128 1965
CAPSELLA-BURSA-PASTORIS ALTHAEA-ROSEA CH 133 1970
CAPSELLA-BURSA-PASTORIS CHENOPODIUM-ALBU 164 1972
CAPSELLA-BURSA-PASTORIS CIRSIUM-ARVENSE 219 1968
CAPSELLA-BURSA-PASTORIS LYSIMACHIA-VULGA 271 1969
CAPSELLA-BURSA-PASTORIS CRUCIFERAE POA-A 289 1972
CAPSICUM MYZUS-PERSICAE MACROSIPHUM-EUPH 009 1969
CAPSICUM-ANNUUM TOMATO EGG-PLANT SOLANUM 102 1972
CAPSICUM-FRUTESCENS NICOTIANA-GOUDSPEEDI 067 1969
CAPSICUM-MEXICANUM. AMARANTHUS-RETROFLEXU 120 1968
CARAWAY CARUM-CARVI NAPOMYZA-LATERALIS M 242 1975
CARDARIA-(LEPIDIUM)-DRABA ONION SUNFLOWE 220 1974
CARDUUS ARTICHOKE CYNARA-SCOLYMUS* ROBE 231 1969
CARDUUS-SPP. CHRYSOCOMA-SP.* KHALIFA. I 148 1972
CARNEGIE. NUMICIA-VIRIDIS SUGARCANE GRAS 052 1967
CARNEGIE. NUMICIA-VIRIDIS SUGARCANE GRAS 053 1969
CAROTROPIS-PROCERA* ABUSHAMA. ELKHIDER. 002 1976
CARROT BOTHYNUS-GIBBOSUS FIELD-CROPS HEL 232 1974
CARROT LUCERNE LETTUCE POTATO MAIZE TOBA 186 1977
CARROT NAPIERGRASS MAIZE* BATRA. VEGETA 030 1969
CARROT PINE OATS BARLEY URTICA-DIOICA* 276 1972
CARROT WILD-CARROT* CELLI. DEPRESSARIA- 054 1970
CARROTS CAMOMILE NAPOMYZA-CICHORII CICHO 242 1975
CARROTS POTATOES WEED-HOSTS PASTURES BAR 123 1973
CARUM-CARVI NAPOMYZA-LATERALIS MATRICARI 242 1975
CARYOPHYLLACEAE CONVOLVULACEAE CASSIDA-N 045 1968
CASSAVA MANIHOT-ESCULENTA HELIANTHUS-ANN 267 1968
CASSIDA-BEROLINENSIS* BROVDII. COMPOSIT 045 1968
CASSIDA-NEBULOSA SUGARBEET CASSIDA-NOBIL 045 1968
CASSIDA-NOBILIS CHENOPODIUM TURNIP RAPE 045 1968
CASSIDA-VIRIDIS HYPOCASSIDA-SUBFERRUGINE 045 1968
CAULIFLOWER CHENOPODIUM-SPP. HELIANTHUS- 126 1976
CAULIFLOWER CYPERUS-ROTUNDUS ECHINOCHLOA 243 1974
CAULIFLOWER RAPE-MUSTARD RADISH TURNIP S 030 1969
CAULIFLOWER RAPE BRASSICA-NAPUS RADISH M 148 1972
CAULIFLOWERS BRUSSELS-SPROUTS CABBAGE SW 097 1977
CEIBA-PENTANDRA KENAF JUTE CORCHORUS-ACU 090 1970
CELERY EULEIA-HERACLEI UMBELLIFERAE* LE 166 1976
CELESTRUS-ORBICULATUS RHAMNUS-JAPONICA R 133 1970
CELLI. DEPRESSARIA-MARCELLA DAUCUS-CAROT 054 1970
CENOPALPUS-BAKERI APPLE QUINCE CRATAEGUS 020 1967
CENOPALPUS-BAKERI* ANONYMOUS. CENOPALPU 020 1967
CENOPALPUS-PULCHER CENOPALPUS-BAKERI APP 020 1967
CENTAUREA-CYANUS* GROMADZKA. RYE APERA- 118 1970

CENTAUREA-REPENS PHYTOMYZA* IVANNIKOV.	135	1969
CEPHUS-PYGMAEUS TRACHELUS-TABIDUS CRUCIF	057	1976
CERCOPIDS GRAMINACEAE CYPERACEAE* TENOR	270	1970
CERDIOCHILES-NIGRICEPS HELIOTHIS-VIRESCE	253	1967
CEREAL GRASSES WHEAT BARLEY RYE OATS MAI	199	1968
CEREAL HYLEMYA-(PHORBIA)-COARCTATA WHEAT	085	1969
CEREAL TRISSOLCUS-SPP. BEAUVERIA-BASSIAN	152	1967
CEREAL* SHAW. WHITE. BARLEY HYLEMYA-(LE	250	1969
CEREAL-CROPS GRASSES RUSHES SEDGES* RAV	225	1970
CEREAL-CROPS WILD-GRASSES* MEIRLEIRE. O	187	1971
CEREAL-CROPS* YUKSEL. EURYGASTER-INTEGR	290	1968
CEREALS BARLEY* ANONYMOUS. CEREALS OPOM	015	1969
CEREALS CEPHUS-PYGMAEUS TRACHELUS-TABIDU	057	1976
CEREALS GRASSES MEROMYZA-SALTATRIX POA-S	094	1969
CEREALS MELIGETHES-AENEUS PHYLLOTRETA-UN	160	1975
CEREALS MILLET WILD-GRASSES ATHERIGONA-S	226	1977
CEREALS OPOMYZA-FLORUM WHEAT WILD-GRASSE	015	1969
CEREALS PSYLLIODES-BRETTINGHAMI PHYLLOTR	030	1969
CEREALS RICE MAIZE SORGHUM CLOVER BIRDSF	026	1972
CEREALS WEED-FOOD-PLANTS* ALIMDZHANOV.	003	1971
CEREALS WHEAT AVENA-SP. TRITICUM-SP. BRO	170	1969
CEREALS WHEAT BARLEY EURYGASTER-MAURA QU	083	1974
CEREALS WILD-GRASSES* ANDERSON. HAPLODI	008	1968
CEREALS WILD-GRASSES REEDS ARMYWORM PHRA	036	1970
CEREALS* KAS'YANOV. RICE SCHIZAPHIS-(TO	147	1970
CERESA-BUBALUS PEACH HAZEL SUNFLOWER OCI	213	1974
CEUTORHYNCHUS-ASSIMILIS CRUCIFERS CHAETO	160	1975
CHAECTONEMA-HORTENSIS PHYLLOTRETA-VITTUL	160	1975
CHAETOCNEMA-BASALIS GYNANDROPSIS-PENTAPH	030	1969
CHAETOCNEMA-CONCINNA WEEDS* LAITINEN. R	160	1975
CHAKROVORTY. HISPA-(DICLADISPA)-ARMIGERA	248	1970
CHAMAEDRYS WILD-PLANTS ORCHARDS* VERASC	282	1966
CHAUDHARY. KAPIL. HYMENIA-RECURVALIS TRI	055	1977
CHEN. HOPPERS RICE NEPHOTETTIX-CINCTICEP	056	1969
CHENOPODIACEAE CARYOPHYLLACEAE CONVOLVUL	045	1968
CHENOPODIACEAE CRUCIFERS CIRCULIFER-TENE	081	1957
CHENOPODIACEAE CHENOPODIUM-POLYSPERMUM S	172	1972
CHENOPODIACEAE RESERVOIRS RHOPALOSIPHUM-	287	1967
CHENOPODIACEAE BEET* ZAITSEVA. PEMPHIGU	291	1970
CHENOPODIACEOUS-WEEDS COMPOSITES* GAPON	103	1975
CHENOPODIACEOUS-WEEDS* MAMONTOVA. PEMPH	177	1975
CHENOPODIUM BEET* MAMONTOVA-SOLUKHA. HA	178	1966
CHENOPODIUM TURNIP RAPE CASSIDA-VIRIDIS	045	1968
CHENOPODIUM-ALBUM POLYGONUM-LAPATHIFOLIU	018	1977
CHENOPODIUM-ALBUM TRIDAX-PROCUMBENS SUNC	061	1972
CHENOPODIUM-ALBUM POLYGONUM-CONVOLVULUS	078	1969
CHENOPODIUM-ALBUM ATRIPLEX-SP. AMARANTHU	116	1977
CHENOPODIUM-ALBUM SUGARBEET* GRIGOROV.	117	1968
CHENOPODIUM-ALBUM* HAGEL. LANDIS. AHREN	123	1973
CHENOPODIUM-ALBUM CYNODON-DACTYLON VICIA	150	1969
CHENOPODIUM-ALBUM HALOGETON-GLOMERATUS H	163	1970
CHENOPODIUM-ALBUM DESCURAINIA-SOPHIA ERI	164	1972
CHENOPODIUM-ALBUM CHENOPODIACEAE CHENOPO	172	1972
CHENOPODIUM-ALBUM* MELEKGHASSEMI. PEGUM	175	1969
CHENOPODIUM-ALBUM AMARANTHUS-RETROFLEXUS	265	1975
CHENOPODIUM-AMARANTICOLOR CLERODENDRON-F	237	1971

CHENOPODIUM-BOTRYS CYNODON-DACTYLON ECHI 237 1971
CHENOPODIUM-MURALE PLANTAGO-MAJOR RUMEX- 001 1972
CHENOPODIUM-MURALE CHENOPODIUM-ALBUM TRI 061 1972
CHENOPODIUM-POLYSPERMUM SONCHUS-ARVENSIS 172 1972
CHENOPODIUM-SP.* GORBATYUK. SUGARBEET P 111 1971
CHENOPODIUM-SPP. BEETS SUGARBEETS* GOLI 110 1972
CHENOPODIUM-SPP. SORGHUM MAIZE PARTHENIU 126 1976
CHENOPODIUM-SPP. HELIANTHUS-SPP. LACTUCA 126 1976
CHERNOV. WHEAT CEREALS CEPHUS-PYGMAEUS T 057 1976
CHERRIES* BANHAM. PRUNUS-EMARGINATA PRU 024 1971
CHERRY GALIUM-SCHULTESII VERONICA CHAMAE 282 1966
CHERRY PRUNUS-CERASUS PRUNUS-DOMESTICA P 246 1977
CHICKPEAS CICER-ARIETINUM CLOVER TRIFOLI 132 1969
CHICORY CARROTS CAMOMILE NAPOMYZA-CICHOR 242 1975
CHILI SOLANUM-CAROLINENSE SOLANUM-PANICU 067 1969
CHILO-INFUSCATELLUS SUGARCANE MAIZE SORG 050 1969
CHILO-SUPPRESSALIS RICE SUGARCANE ZIZANI 062 1972
CHILO-SUPPRESSALIS RICE ECHINOCHLOA-CRUS 230 1977
CHIROTHRIPS-MAXIMI CHIROTHRIPS-RAMAKRISH 007 1977
CHIROTHRIPS-MERIDIONALIS PENNISETUM-AMER 007 1977
CHIROTHRIPS-MEXICANUS PENNISETUM-TYPHOID 007 1977
CHIROTHRIPS-RAMAKRISHNAI CHIROTHRIPS-MER 007 1977
CHIYKOVSKI. APHRODES-BICINCTA STRAWBERRY 058 1970
CHLORIDEA-OBSOLETA SPODOPTERA-(LAPHYGMA) 003 1971
CHLORIS-BARBATA CHIROTHRIPS-MAXIMI CHIRO 007 1977
CHLOROPHORA-EXCELSA CNESTIS-FERRUGINEA F 087 1973
CHLOROPS-PUMILIONIS BARLEY WHEAT RYE WIL 013 1976
CHO. CHILO-SUPPRESSALIS RICE SUGARCANE Z 062 1972
CHOI. LEE. LAODELPHAX-STRIATELLA NEPHOTE 059 1976
CHON. HYUN. PARK. LAODELPHAX-STRIATELLA 060 1975
CHOUDARY. KHATRI. MARASMIA-TRAPEZALIS BR 208 1975
CHOUDHURY. MUKHERJEE. WILD-PLANTS HOSTS 061 1972
CHRISTMAS-PALM STENOTAPHRUM-SECUNDATUM P 228 1977
CHROZOPHORA-ROTTLERI TRICHODESMA-AMPLEXI 139 1974
CHROZOPHORA-ROTTLERI TRICHODESMA-AMPLEXI 140 1975
CHRYSANTHEMUM-MORIFOLIUM CONVOLVULUS-ARV 068 1972
CHRYSANTHEMUM-MORIFOLIUM-VAR.-SINENSE FR 133 1970
CHRYSANTHEMUM-SPP. TAGETES-INDICA CALEND 258 1976
CHRYSOCOMA-SP.* KHALIFA. ISA. AWADALLAH 148 1972
CHRYSOMELIDAE-GALERUCINAE CUCURBITACEAE 263 1978
CICER-ARIETINUM CLOVER TRIFOLIUM-ALEXAND 132 1969
CICER-ARIETINUM* SCHALK. ACYRTHOSIPHON- 244 1973
CICHORIUM-ENDIVIA SONCHUS-SP. NAPOMYZA-C 242 1975
CICHORIUM-INTYBUS BRASSICA-KABER MELILOT 061 1972
CICHORIUM-SP. LETTUCE ENDIVE CICHORIUM-E 242 1975
CICHORIUM-SP. SINAPIS-ALBA MELILOTUS-IND 001 1972
CICHORIUM-SP. TRIFOLIUM-PRATENSE TARAXAC 022 1976
CINERARIA-CRUENTA CHRYSANTHEMUM-MORIFOL 068 1972
CINGULATA-INDIFFERENS CHERRIES* BANHAM. 024 1971
CIOCHIA. MUSTATEA. BOTHYNODERES-PUNCTIVE 063 1977
CIRCULIFER-TENELLUS* DOUGLASS. HALLOCK. 081 1957
CIRPHIS-COMPTA SPODOPTERA-(CIRPHIS)-COMP 144 1971
CIRPHIS-UNIPUNCTA MYTHIMNA-(CIRPHIS)-UNI 026 1972
CIRSIUM CARDUUS ARTICHOKE CYNARA-SCOLYMU 231 1969
CIRSIUM LARINUS-SCOLYMI LARINUS-CYNARAE 257 1968
CIRSIUM-ALTISSIMUM PUBLILIA-CONCAVA SILP 218 1978

CIRSIUM-ARVENSE DIABROTICA-LONGICORNIS*	137	1971
CIRSIUM-ARVENSE GLOBE-ARTICHOKE SAFFLOWE	210	1977
CIRSIUM-ARVENSE CONVOLVULUS-ARVENSIS MAL	219	1968
CIRSIUM-ARVENSE EUPHORBIA-SP. VERONICA-C	220	1974
CIRSIUM-ARVENSE CONVOLVULUS-ARVENSIS* T	266	1975
CIRSIUM-DISCOLOR CIRSIUM-ALTISSIMUM PUBL	218	1978
CITRUS PEACH APPLE* ELSHAFIE. NYSIUS-VI	089	1976
CITRUS TEA* KAS'YANOV. HOMOROCORYPHUS-N	146	1971
CITRUS URTICA* BERBAGALLO. CALOCORIS-(C	033	1970
CITRUS WEEDS* VASSILAINA-ALEXOPOULOU. M	278	1970
CITRUS-BLOSSOM-MIDGE* PRASAD. DASINEURA	212	1968
CITRUS-MEDICA* PANDEY. BUGAWAT. PAPILIO	205	1969
CITRUS-SP. CONVOLVULUS-ARVENSIS FUMARIA-	150	1969
CLEOME-VISCOSA PULSES* MACCI. MUNSHI. N	171	1972
CLERODENDRON FABACEAE* ANONYMOUS. FRANK	011	1978
CLERODENDRON-FRAGRANS CYPERUS-ESCULENTUS	237	1971
CLERODENDRON-TRICHOTOMUM CALLICARPA-JAPO	133	1970
CLOVER APION-AESTIMATUM APION-AESTIVUM A	222	1969
CLOVER BIRDSFOOT-TREFOIL LOTUS-CORNICULA	026	1972
CLOVER CITRUS WEEDS* VASSILAINA-ALEXOPO	278	1970
CLOVER CORN SORGHUM MILLET BELL-PEPPERS	183	1976
CLOVER ERAGROSTIS-BIPINNATA XANTHIUM-STR	001	1972
CLOVER NETTLE LUPIN* HAMMAD. RAAFAT. VA	124	1973
CLOVER TRIFOLIUM-REPENS TOMATO CAPSICUM-	120	1968
CLOVER TRIFOLIUM-ALEXANDRINUM PORTULACA-	132	1969
CLOVERS GRASSES VEGETABLE-CROPS CARROTS	123	1973
CNAPHALOCROCIS-MEDINALIS PENNISETUM-PEDI	207	1975
CNAPHALOCROCIS-MEDINALIS RICE ORYZA-PERE	280	1973
CNAPHALOCROCIS-MEDINALIS BRACHIARIA-MUTI	281	1976
CNEPHASIA-PUMICANA CRUCIFERS LEGUMINOSAE	148	1972
CNESTIS-FERRUGINEA FICUS-VOGELIANA LECAN	087	1973
COCCUS-HESPERIDUM ALBIZIA-ZYGIA CHLOROPH	087	1973
COCCUS-VIRIDIS* D'SAUZA. BHAT. BALARAMM	082	1969
COCHLEARIA-OFFICINALIS BRASSICA-RAPA ERY	097	1977
COCHLERIA-ANGLICA BARBAREA-VULGARIS* FI	097	1977
COCOA EMPOASCA-SPP. AFROCCIDENS-LODOSI A	012	1969
COCONUT-PALMS* TSAI. KIRSCH. HAPLAXIUS-	273	1978
COFFEE AMARANTHUS-GRACILIS LUDWIGIA-LYSS	035	1972
COFFEE DIACHRYSIA-(PHYTOMETRA)-ORICHALCE	027	1974
COIX-LACRYMA-JOBI MAIZE PENNISETUM-PURPU	217	1970
COIX-LACRYMA-JOBI* REZWANY. SCHAHOSSEIN	230	1977
COLA-CARICIFOLIA COCCUS-HESPERIDUM ALBIZ	087	1973
COLA-NITIDA CREMATOGASTER-BUCHNERI ANTS	087	1973
COLDS-NUCIFERA* REINERT. HAPLAXIUS-CRUD	228	1977
COLLARDS SOYBEANS PEANUTS TOMATOES XANTH	183	1976
COMMICARPUS-COMMERSONII* BOURNIER. CALI	043	1968
COMPOSITAE ABELMOSCHUS-ESCULENTUS CALADI	237	1971
COMPOSITAE HELIANTHUS-ANNUUS AMARANTHUS-	232	1974
COMPOSITAE KOCHIA-AMERICANA ALFALFA SOYB	163	1970
COMPOSITAE LABIATAE CHENOPODIACEAE CARYO	045	1968
COMPOSITAE LEGUMINOSAE BORRAGINACEAE* T	264	1977
COMPOSITAE TARAXACUM-OFFICINALE PLANTAGO	172	1972
COMPOSITAE UMBELLIFERAE* MAKAROV. LUCER	174	1968
COMPOSITAE WHEAT BARLEY AVENA-FATUA FLAX	148	1972
COMPOSITAE* STENSETH. PLUM BRACHYCAUDUS	256	1970
COMPOSITES* GAPONOVA. ZHUKOVA. STRUKOVA	103	1975

CONIFERS APPLE PEAR CRATAEGUS* DOMENICH 079 1968
CONTARINA-SORGHICOLA SORGHUM SORGHUM-HAL 224 1976
CONTARINIA-SORGHICOLA SORGHUM-HALEPENSE 235 1975
CONTARINIA-SORGHICOLA SORGHUM SORGHUM-HA 259 1975
CONTARINIA-SORGHICOLA SORGHUM-HALEPENSE* 260 1976
CONTARINIA-TRITICI WHEAT AGROPYRON-REPEN 041 1969
CONVALLARIA-MAJALIS CINERARIA-CRUENTA C 068 1972
CONVOLVULACEAE CASSIDA-NEBULOSA SUGARBEE 045 1968
CONVOLVULACEAE CHENOPODIUM-ALBUM CHENOPO 172 1972
CONVOLVULUS ALTHAEA-SPP.* HABIBI. BEMIS 122 1975
CONVOLVULUS-ARVENSIS CYPERUS-DIFFORMIS C 001 1972
CONVOLVULUS-ARVENSIS CARROT NAPIERGRASS 030 1969
CONVOLVULUS-ARVENSIS TILIA-PLATYPHYLLOS* 068 1972
CONVOLVULUS-ARVENSIS FUMARIA-INDICA CHEN 150 1969
CONVOLVULUS-ARVENSIS MALVA-SP. POLYGONUM 219 1968
CONVOLVULUS-ARVENSIS* TAMAKI. MOFFITT. 266 1975
CONVOLVULUS-SEPIUM CONVOLVULACEAE CHENOP 172 1972
CONYZA-AMBIGUA* PUTTARUDRIAH. ESWARAMUR 215 1976
CONYZA-CANADENSIS PRIONOPSIS-CILIATA SOL 232 1974
CUPPARIDACEAE CRUCIFERAE TROPAEOLACEAE B 095 1970
CORCHORUS-ACUTANGULUS WILD-MALVACEOUS-PL 090 1970
CORCHORUS-OLITORIUS-VAR.-INCISIFOLIUS VE 001 1972
CORDINGLEY. DANIHANARAYANA. CAPEWEED-(AR 064 1976
COREOPSIS-TRIPTERIS ENTYLIA-BACTRIANA EU 218 1978
CORN COTTON SORGHUM LETTUCE SOYBEAN TOMA 125 1976
CORN ERIGERON-SPP. AMBROSIA-SP. SUGARBEE 123 1973
CORN GRAMINACEOUS-CROPS POLYGONUM-SP. TY 073 1971
CORN MAIZE POLYGONUM-PENNSYLVANICUM AMAR 137 1971
CORN SORGHUM MILLET BELL-PEPPERS BUSH-BE 183 1976
CORN STRING-BEANS BLACKEYED-PEAS* GRAHA 113 1970
CORVUS-FRUGILEGUS* MERLEIRE. AGROTIS-SE 186 1977
CORYLUS-AVELLANA PARORNIX-AVELLANELLA PH 077 1971
CORYLUS-AVELLANA FALSE-ACACIA ROBINIA-PS 251 1976
COSMOBARIS-AMERICANA SUGARBEETS AMARANTH 163 1970
COSMOS-SULPHUREUS CALENDULA-OFFICINALIS* 197 1969
COSTA. LOBATU. BLISSUS-LEUCOPTERUS BRACH 229 1976
COSTILLA. BESCO. LEVI. OSORES. MOCIS-LAT 065 1973
COSTILLA. MERCADO. SPODOPTERA-FRUGIPERDA 066 1968
COTTON AMARANTHUS-SPP. BELL-PEPPERS CHEN 126 1976
COTTON ANTS AMARANTHUS-RETROFLEXUS ATRIP 219 1968
COTTON COMMICARPUS-COMMERSONII* BOURNIE 043 1968
COTTON CONVOLVULUS ALTHAEA-SPP.* HABIBI 122 1975
COTTON CROTON-CAPITATUS-VAR.-ALBINOIDES 247 1969
COTTON CUCUMBER BEANS PHASEOLUS-VULGARIS 278 1970
COTTON GOSSYPIUM-ANOMALUM* CADEILHAN-GI 051 1968
COTTON GOSSYPIUM-BARBADENSE HIBISCUS-ESC 076 1971
COTTON GROUNDNUTS KENAF HIBISCUS-CANNABI 102 1972
COTTON KAPOK CEIBA-PENTANDRA KENAF JUTE 090 1970
COTTON MAIZE LENTIL LENS-ESCULENTA WHEAT 132 1969
COTTON MALVA-SPP. ALTHAEA-SPP. HIBISCUS- 092 1977
COTTON MALVACEAE ALTHARA-TAURINENSIS ALT 048 1969
COTTON MALVACEAE HIBISCUS-SPP. ABUTILON- 227 1977
COTTON MALVACEOUS STERCULIACEOUS ABUTILO 249 1970
COTTON MYZUS-PERSICAE BEMISIA-TABACI TET 255 1967
COTTON OKRA KENAF* LESTON. OXYCARENUS-F 167 1970
COTTON OKRA VERBENA-SP. SQUASH MEDICAGO- 113 1970

COTTON QUERCUS-HAVARDII PROSOPIS-GLANDUL	236	1970
COTTON SINAPIS-ARVENSIS ATRIPLEX-NITEUS	220	1974
COTTON SISYMBRIUM-IRIO WHEAT BARLEY SORG	216	1975
COTTON SORGHUM LETTUCE SOYBEAN TOMATOES	125	1976
COTTON SORGHUM MAIZE SUNFLOWER* ROOME.	233	1974
COTTON WILD-PERENNIAL-MALVACEOUS-PLANTS*	288	1972
COTTON* KRAEMER. MALVASTRUM-SPICATUM ME	159	1966
COTTON* SABINE. PECTINOPHORA-SCUTIGERA	238	1969
COVIELLO. PENDERY. BUSHING. CONTARINIA-S	259	1975
COVIELLO. PENDERY. BUSHING. CONTARINIA-S	260	1976
COWPEA CUCURBITS CABBAGE CAULIFLOWER RAP	030	1969
COWPEAS WILD-LEGUMINOUS-PLANTS* TAYLOR.	269	1967
CRATAEGUS* DOMENICHINI. PSYLLA-MELANONE	079	1968
CRATAEGUS-SPP. STONE-FRUITS LOQUAT ERIOB	020	1967
CREMATOGASTER-BUCHNERI ANTS PHYLLANTHUS-	087	1973
CREMATOGASTER-SP. COLA-NITIDA CREMATOGAS	087	1973
CROTON-CAPITATUS-VAR.-ALBINOIDES SOLANUM	247	1969
CRUCIFER* ROOT. TAHVANAINEN. BARBAREA-V	234	1969
CRUCIFERAE POA-ANNUA* WOOD-BAKER. MACRO	289	1972
CRUCIFERAE TROPAEOLACEAE BROCCOLI MUSTAR	095	1970
CRUCIFEROUS-PLANTS* BURGESS. RAPE BRASS	049	1972
CRUCIFEROUS-WEEDS* CHERNOV. WHEAT CEREA	057	1976
CRUCIFERS BRASSICA-OLERACEA* TAHVANAINE	262	1970
CRUCIFERS CHAETOCNEMA-CONCINNA WEEDS* L	160	1975
CRUCIFERS CIRCULIFER-TENELLUS* DOUGLASS	081	1957
CRUCIFERS LEGUMINOSAE GRAMINACEAE. COMPOS	148	1972
CRUCIFERS* BARAN. BREVICORYNE-BRASSICAE	025	1970
CRUCIFERS* WHITE. APHIS-CRACCIVORA CHEN	287	1967
CUCUMBER BEANS PHASEOLUS-VULGARIS BEET B	278	1970
CUCUMBER MELON WEED* MINORANSKII. FORFI	190	1968
CUCUMBER SQUASH* GOKSU. ATAK. TETRANYCH	108	1972
CUCUMIS-MELO POYEE BASELLA-ALBA GANTHORA	243	1974
CUCURBITA-ANDREANA CUCURBITA-TEXANA CUCU	131	1973
CUCURBITA-ECUADORENSIS CUCURBITA-LUNDELL	131	1973
CUCURBITA-FICIFOLIA CUCURBITA-MOSCHATA C	131	1973
CUCURBITA-FOETIDISSIMA CUCURBITA-PERDATI	131	1973
CUCURBITA-GRACILIOR CUCURBITA-FOETIDISSI	131	1973
CUCURBITA-LUNDELLIANA CUCURBITA-SORORIA	131	1973
CUCURBITA-MAXIMA SQUASH CUCURBITA-PEPO P	131	1973
CUCURBITA-MIXTA CUCURBITA-FICIFOLIA CUCU	131	1973
CUCURBITA-MOSCHATA CUCURBITA-ANDREANA CU	131	1973
CUCURBITA-OKEECHOBEENSIS CUCURBITA-ECUAD	131	1973
CUCURBITA-PALMATA* HOWE. RHODES. MELITT	131	1973
CUCURBITA-PEPO PUMPKIN CUCURBITA-MIXTA C	131	1973
CUCURBITA-PERDATIFOLIA CUCURBITA-PALMATA	131	1973
CUCURBITA-SORORIA CUCURBITA-GRACILIOR CU	131	1973
CUCURBITA-TEXANA CUCURBITA-OKEECHOBEENSI	131	1973
CUCURBITACEAE RUBUS* TAKIZAWA. CHRYSOME	263	1978
CUCURBITS CABBAGE CAULIFLOWER RAPE-MUSTA	030	1969
CUCURBITS* INAIZUMI. APHIS-GOSSYPII VEG	133	1970
CUNNINGHAM. PHTHORIMAEA-OPERCULELLA SOLA	067	1969
CUPANIOIDES LEEA-GUINEENSIS RAUWOLFIA-VO	087	1973
CYMBOPOGON-CITRATUS COIX-LACRYMA-JOBI MA	217	1970
CYMBOPOGON-NARDUS TRIPSACUM-LAXUM ORYZA-	217	1970
CYMBOPOGON-SP. PASPALUM-SCROBICULATUM AT	226	1977
CYNARA CIRSIUM LARINUS-SCOLYMI LARINUS-C	257	1968

CYNARA THISTLE CLOVER NETTLE LUPIN* HAM 124 1973
CYNARA-SCOLYMUS* ROBERT. CAPITOPHORUS-H 231 1969
CYNARA-SCOLYMUS TERELLIA-FUSCICARNIS CYN 257 1968
CYNODON ECHINOCHLOA CYPERUS* DEAN. NOMA 071 1968
CYNODON SETARIA* KONTEV. ORIA-MUCULOSA 158 1973
CYNODON-DACTYLON CYPERUS-ROTUNDUS EUPHOR 002 1976
CYNODON-DACTYLON ECHINOCHLOA-CRUS-GALLI 075 1969
CYNODON-DACTYLON ECHINOCHLOA-COLONUM LEE 096 1968
CYNODON-DACTYLON IMPERATA-CYLINDRICA* I 132 1969
CYNODON-DACTYLON HEMARTHRIA-COMPRESSA CY 134 1976
CYNODON-DACTYLON CYPERUS-ROTUNDUS ECHINO 144 1971
CYNODON-DACTYLON VICIA-HIRSUTA* KHAN. D 150 1969
CYNODON-DACTYLON VEITCHIA-MERRILLII COLD 228 1977
CYNODON-DACTYLON ECHINOCHLOA-COLONUM ELE 237 1971
CYNODON-DACTYLON* SAXENA. FERRISIA-VIRG 243 1974
CYNODON-DACTYLON PANICUM-PURPURASCENS CY 273 1978
CYNODON-DACTYLON SORGHUM-HALAPENSE IMPER 283 1976
CYNTHIA-(VANESSA)-CARDUI MALLOW ARTICHOK 124 1973
CYPERACEAE CYPERUS-SP., FIMBRISTYLIS-SP. 154 1968
CYPERACEAE JUNCACEAE WHEAT BARLEY OATS A 182 1972
CYPERACEAE MACROSIPHUM-AVENAE RHOPALOSIP 225 1970
CYPERACEAE* TENORIO. MANAZES. SUGARCANE 270 1970
CYPERUS* DEAN. NOMADACRIS-SEPTEMFASCIAT 071 1968
CYPERUS-DIFFORMIS CICHORIUM-SP. SINAPIS- 001 1972
CYPERUS-ESCULENTUS* MOORE. MUELLER. SPI 194 1976
CYPERUS-ESCULENTUS DIGITARIA-SANGUINALIS 237 1971
CYPERUS-ESCULENTUS SEDGES COCONUT-PALMS* 273 1978
CYPERUS-IRIA BALIOTHRIPS-BIFORMIS MAIZE 005 1977
CYPERUS-ROTUNDUS EUPHORBIA-HETEROPHYLLA 002 1976
CYPERUS-ROTUNDUS SORGHUM-HALEPENSE MAIZE 134 1976
CYPERUS-ROTUNDUS ECHINOCHLOA-COLONUM ELE 144 1971
CYPERUS-ROTUNDUS ECHINOCHLOA-COLONUM CYN 243 1974
CYPERUS-SP. FIMBRISTYLIS-SP. ELEOCHARIS- 154 1968
D'SAUZA. BHAT. BALARAMMENON. CANTHIUM-DI 082 1969
DABOROWSKI. MAREŽAK. TETRANYCHUS-URTICAE 068 1972
DACTYLIS-GLOMERATA FESTUCA-RUBRA AGROPYR 047 1967
DACTYLIS-GLOMERATA PHALARIS-CANARIENSIS* 073 1971
DACTYLIS-GLOMERATA LOLIUM-PERENNE WHEATS 192 1969
DACTYLIS-GLOMERATA* TAMAKI. WEEDS ORCHA 265 1975
DACTYLOCTENIUM-AEGYPTIUM ECHINOCHLOA-COL 248 1970
DAGNEAUD. SITOCIPLOSIS-MOSELLANA CONTARI 041 1969
DAMSON PEACH PRUNUS-CERASIFERA-"NIGRA" P 246 1977
DANTHANARAYANA. CAPEWEED-(ARCTOTHECA-CAL 064 1976
DANTHANARAYANA. XYLEBORUS-FORNICATUS TEA 069 1968
DAPHNE-OLEOIDES ACANTHOLIMON-VENUSTRUM 083 1974
DAS. PAINAIK. LEUCINODES-ORBONALIS BRINJ 070 1971
DASINEURA-CITRI GNAPHALIUM-INDICUM CITRU 212 1968
DATURA-METEL DATURA-STRAMONIUM NICANDRA- 067 1969
DATURA-STRAMONIUM NICANDRA-PHYSALODES NI 067 1969
DATURA-STRAMONIUM* VARGAS. GNORIMOSCHEM 275 1970
DATURA-SUAVEOLENS PHYSALIS-ANGULATA NICO 067 1969
DAUCUS-CAROTA CARROT WILD-CARROT* CELLI 054 1970
DAUGHERTY. ROBBINS. BARRY. HOUSER. DECTU 127 1975
DAVIES. CEREALS MILLET WILD-GRASSES ATHE 226 1977
DAVIS. JOOS. BEARDEN. BERLOWITZ. PEAR EU 029 1976
DEAN. NOMADACRIS-SEPTEMFASCIATA LAWNS CY 071 1968

DECAZY. BOXIOPSIS-MADAGASCARIENSIS CACAO	072	1974
DECTUS-TEXANUS SOYBEAN AMBROSIA-SPP.* H	127	1975
DEEKER. MADDOX. SIMYRA-HENRICI CORN GRAM	073	1971
DEMONG. PHYLLOTRETA-CRUCIFERAE PHYLLOTRE	095	1970
DEPRESSARIA-MARCELLA DAUCUS-CAROTA CARRO	054	1970
DESCHAMPSIA-CAESPITOSA HORDEUM-MURINUM*	047	1967
DESCURAINIA-INCISUM LAMIUM-AMPLEXICAULE	032	1969
DESCURAINIA-SOPHIA ERIGERON-CANADENSIS G	164	1972
DESMODIUM-PURPUREUM CERDIOCHILES-NIGRICE	253	1967
DESMOSTACHYA-BIPINNATA ELEUSINE-SP. MAIZ	193	1969
DHANARAJAN. ENDOCLITA-GMELINA TEAK LANTA	074	1976
DHOORIA. OLIGONYCHUS-INDICUS MAIZE SUGAR	241	1975
DIABROTICA-LONGICORNIS SETARIA-VIRIDIS S	044	1967
DIABROTICA-LONGICORNIS* JACQUES. PETERS	137	1971
DIACHRYSIA-(PHYTOMETRA)-ORICHALCEA BIDEN	027	1974
DIATARAXIA-(MAMESTRA)-OLERACEA CHENOPODI	078	1969
DIATRAEA-SACCHARALIS EUCHLAENA-MEXICANA	217	1970
DICANTHIUM-ANNULATUM JOWAR OLIGONYCHUS-(	149	1956
DICKSON. LAIRD. SORGHUM SCHIZAPHIS-GRAMI	075	1969
DICLADISPA-(HISPA)-ARMIGERA RICE DACTYLO	248	1970
DICLADISPA-ARMIGERA RICE PASPALUM-SANGUI	211	1977
DIDESMOCOCCUS-UNIFASCIATUS BRACHYCAUDUS-	264	1977
DIGITALIS-PURPUREA GERANIUM-PUSILLUM* M	196	1970
DIGITARIA-ADSCENDENS BRACHIARIA-REPTANS	114	1972
DIGITARIA-ADSCENDENS ATHERIGONA-ERIOCHLO	226	1977
DIGITARIA-ADSCENDENS ELEUSINE-INDICA LEP	248	1970
DIGITARIA-DECUMBENS GRAMINACEAE FORAGE-G	119	1969
DIGITARIA-SANGUINALIS* COSTILLA. BESCO.	065	1973
DIGITARIA-SANGUINALIS ECHINOCHLOA-CRUS-G	237	1971
DIGITARIA-SP. ORYZA-SP.* KING. RICE CYP	154	1968
DIMARTINO. WHEAT AELIA-ROSTRATA DOLYCORI	106	1978
DIMETRY. OXYCARENUS-HYALINIPENNIS MALVAC	076	1971
DIMIC. LEAF-MINERS HAZEL CORYLUS-AVELLAN	077	1971
DIOPSIS-APICALIS TENUIPES ECHINOCHLOA-CO	195	1973
DIOPSIS-ICHNEUMONEA DIOPSIS-APICALIS TEN	195	1973
DIOSCOREA-ESCULENTA CAULIFLOWER CYPERUS-	243	1974
DIPAROPSIS-TEPHRAGRAMMA COTTON GOSSYPIUM	051	1968
DIPTERA CEREAL GRASSES WHEAT BARLEY RYE	199	1968
DOCHKOVA. DIATARAXIA-(MAMESTRA)-OLERACEA	078	1969
DOLYCORIS-BACCARUM EURYGASTER-MAURA EURY	105	1977
DOLYCORIS-BACCARUM EURYGASTER-SPP. BARLE	106	1978
DOMENICHINI. PSYLLA-MELANONEVRA CONIFERS	079	1968
DONCHEV. THRIPS* DONCHEV. THRIPS* DONC	080	1968
DOUGLASS. HALLOCK. CHENOPODIACEAE CRUCIF	081	1957
DUVAL JOSHI. PETROBIA-LATENS BARLEY WHEA	150	1969
DUNNING. WOLFE. SUGARBEET MACROSIPHUM-SL	128	1965
DURAN. AELIA-ROSTRATA CEREALS WHEAT BARL	083	1974
DURANT. OSTRINIA-NUBILALIS MAIZE PANICUM	084	1969
DUSEK. CEREAL HYLEMYA-(PHORBIA)-COARCTAT	085	1969
DYADYECHKO. AGROTIS-SEGETUM WEEDS* DYAD	086	1968
DYSDERCUS-CINGULATUS OKRA HIBISCUS-ESCUL	090	1970
DYSDERCUS-CINGULATUS CHRUZOPHORA-ROTTLER	139	1974
DYSDERCUS-CINGULATUS CHROZOPHORA-ROTTLER	140	1975
EARIAS-BIPLAGA EARIAS-INSULANA COTTON MA	227	1977
EARIAS-INSULANA COTTON MALVA-SPP. ALTHAE	092	1977
EARIAS-INSULANA COTTON MALVACEAE HIBISCU	227	1977

ECHINOCHLOA CYPERUS* DEAN. NOMADACRIS-S	071	1968
ECHINOCHLOA-COLONUM CYPERUS-IRIA BALIOTH	005	1977
ECHINOCHLOA-COLONUM LEERSIA-HEXANDRA LEP	096	1968
ECHINOCHLOA-COLONUM SETARIA-VERTICILLATT	134	1976
ECHINOCHLOA-COLONUM RICE* KALODE. YADAV	143	1969
ECHINOCHLOA-COLONUM ELEUSINE-INDICA SETA	144	1971
ECHINOCHLOA-COLONUM BRACHIARIA-LATA* MO	195	1973
ECHINOCHLOA-COLONUM HYMENACHNE-AMPLEXICA	217	1970
ECHINOCHLOA-COLONUM ERIOCHLOA-PROCERA CY	226	1977
ECHINOCHLOA-COLONUM ELEUSINE-INDICA GLYS	237	1971
ECHINOCHLOA-COLONUM CYNODON-DACTYLON* S	243	1974
ECHINOCHLOA-COLONUM DIGITARIA-ADSCENDENS	248	1970
ECHINOCHLOA-COLONUM* VELUSAMY. SUBRAMAN	281	1976
ECHINOCHLOA-CRUS-GALLI RICE* ANANTHAKRI	006	1976
ECHINOCHLOA-CRUS-GALLI* BARBULESCU. CIR	026	1972
ECHINOCHLOA-CRUS-GALLI LOLIUM-MULTIFLORU	075	1969
ECHINOCHLOA-CRUS-GALLI RICE* KIM. KUH.	153	1975
ECHINOCHLOA-CRUS-GALLI ATHERIGONA-APPROX	226	1977
ECHINOCHLOA-CRUS-GALLI COIX-LACRYMA-JOBI	230	1977
ECHINOCHLOA-CRUS-GALLI FAGOPYRUM-ESCULEN	237	1971
EGG-PLANT BRINJAL TOMATO SPINACH STRAWBE	162	1977
EGG-PLANT SOLANUM-MELONGENA BEANS PHASEO	102	1972
EGG-PLANT SOLANUM-MELONGENA CUCURBITS*	133	1970
EGGPLANT SOLANUM-TORVUM LYCOPERSICON-ESC	067	1969
EGUAGIE. CREMATOGASTER-SP. COLA-NITIDA C	087	1973
EGYPTIAN-CLOVER TRIFOLIUM-ALEXANDRINUM F	148	1972
EL-KADAY. HASSAN. ATTIA. HYALOPTERUS-PRU	088	1971
EL-S-NASR. NASSIF. SPODOPTERA-LITTORALIS	200	1970
EL-SHERIF. NAGUIB. SPODOPTERA-LITTORALIS	001	1972
ELEOCHARIS-SP. ELEUSINE-INDICA PANICUM-S	154	1968
ELEUSINE-INDICA ATHERIGONA-SUCCATA SORGH	114	1972
ELEUSINE-INDICA SETARIA-GLAUCA SORGHUM Z	144	1971
ELEUSINE-INDICA PANICUM-SP. DIGITARIA-SP	154	1968
ELEUSINE-INDICA AXONOPUS-SCOPARIUS CYMBO	217	1970
ELEUSINE-INDICA GLYSINE-MAX GOSSYPIUM-HI	237	1971
ELEUSINE-INDICA LEPTOCHLOA-FILIFORMIS LE	248	1970
ELEUSINE-SP. MAIZE* MOIZ. NAGVI. ATHERI	193	1969
ELKHIDER. TRUXALIS-GRANDIS-GRANDIS CYNOD	002	1976
ELSHAFIE. NYSIUS-VINITOR PORTULACA-OLERA	089	1976
EMPOASCA-SP. TETRANYCHUS-URTICAE COTTON	255	1967
EMPOASCA-SPP. AFROCCIDENS-LOOOSI AFROCCI	012	1969
ENCARNACION. DYSDERCUS-CINGULATUS OKRA H	090	1970
ENDIVE CARROT LUCERNE LETTUCE POTATO MAI	186	1977
ENDIVE CICHORIUM-ENDIVIA SONCHUS-SP. NAP	242	1975
ENDOCLITA-GMELINA TEAK LANTANA EUPATORIU	074	1976
ENTYLIA-BACTRIANA EUPATORIUM-SEROTINUM L	218	1978
EPILACHNA-SIMILIS MAIZE RICE SUGARCANE S	245	1974
EPILACHNA-VARIVESTIS WILD-PLANTS* KIER-	151	1967
EPILOBIUM-ANGUSTIFOLIUM CAPSELLA-BURSA-P	271	1969
EPIPHYAE-POSTVITTANA APPLE* CORDINGLEY.	064	1976
ERAGROSTIS-BIPINNATA XANTHIUM-STRUMARIUM	001	1972
EREMOCHLOA-OPHIUROIDES CYNODON-DACTYLON	273	1978
ERIGERON-ANNUUS HELIANTHUS-TUBEROSUS EUP	218	1978
ERIGERON-CANADENSIS BRASSICA-SP.* CHIYK	058	1970
ERIGERON-CANADENSIS GLADIOLUS-SP. LACTUC	164	1972
ERIGERON-SPP. AMBROSIA-SP. SUGARBEET BRO	123	1973

ERIOBOTYRA-JAPONICA WALNUT CENOPALPUS-BA 020 1967
ERIOCAULON-SEXANGULARE* GARGAV. KATIYAR 104 1972
ERIOCHLOA-PROCERA CYMBOPOGON-SP. PASPALU 226 1977
ERIOISCHIA-BRASSICAE CAULIFLOWERS BRUSSE 097 1977
ERKAM. GURSES. SITONA-CRINITUS PHYLLOBIU 004 1972
ERYSIMUM-AUREUM COCHLERIA-ANGLICA BARBAR 097 1977
ESPUL. MANSUR. MIOGRYLLUS-CONVOLUTUS VIN 169 1971
ESWARAMURTHY. PLANOCOCCOIDES-ROBUSTUS MA 215 1976
EUCHLAENA-MEXICANA CYMBOPOGON-CITRATUS C 217 1970
EUGRAPHE-SIGMA LACANOBIA-THALASSINA MAME 198 1976
EULEIA-HERACLEI UMBELLIFERAE* LEROI. PH 166 1976
EUPATORIUM* DHANARAJAN. ENDOCLITA-GMELI 074 1976
EUPATORIUM-PURPUREUM RUDBEKIA-LACINIATA 218 1978
EUPATORIUM-SEROTINUM LACTUCA-FLORIDANA H 218 1978
EUPHORBIA-HETEROPHYLLA CAROTROPIS-PROCER 002 1976
EUPHORBIA-SP. VERONICA-CAMPYLOPODA CARDA 220 1974
EUPHORBIACEAE* DANTHANARAYANA. XYLEBORU 069 1968
EURYGASTER-AUSTRIACA GYMNOSOMA* GENDUSO 105 1977
EURYGASTER-INTEGRICEPS CEREAL TRISSOLCUS 152 1967
EURYGASTER-INTEGRICEPS CEREAL-CROPS* YU 290 1968
EURYGASTER-MAURA QUERCUS-SPP. PINUS-NIGR 083 1974
EURYGASTER-MAURA EURYGASTER-AUSTRIACA GY 105 1977
EURYGASTER-SPP. BARLEY TREES SHRUBS GRAS 106 1978
EUSCHISTUS-CONSPERSUS LEPTOCORIS-RUBROLI 029 1976
EUTROMULA-(SIMAETHIS)-PARIANA PIMPINELLA 141 1970
EUXOA-OBERTHUERI CHENOPODIUM-ALBUM POLYG 018 1977
EUXOA-OCHROGASTER ASPARAGUS CIRSIUM-ARVE 266 1975
EUXOA-SEGETUM PROTEXARNIS-SQUALIDA AGROT 018 1977
EUXOA-TRISTICULA SUGARBEET WEEDS ALFALFA 136 1969
FABA-BEANS WEEDS VICIA-SPP. MEDICAGO-LUP 173 1977
FABACEAE* ANONYMOUS. FRANKLINIELLA-BREV 011 1978
FABER. HAPLODIPLOSIS-EQUESTRIS WHEAT BAR 091 1970
FABINA-IMBRICATA HYOSCYAMUS-ALBUS LYCIUM 067 1969
FAGOPYRUM-ESCULENTUM GERANIUM-CAROLINIAN 237 1971
FALSE-ACACIA ROBINIA-PSEUDOACACIA SOYBEA 251 1976
FASELI. EARIAS-INSULANA COTTON MALVA-SPP 092 1977
FED'KO. PISARENKO. LETHRUS-APTERUS MAIZE 093 1977
FEDOSEEVA. MEROMYZA-NIGRIVENTRIS CEREALS 094 1969
FEENY. PAAVWE. DEMONG. PHYLLOTRETA-CRUCI 095 1970
FENUGREEK TRIGONELLA-FOENUM-GRAECUM CHIC 132 1969
FENUGREEK TRIGONELLA-FOENUM-GRAECUM BROA 148 1972
FERINO. HYDRELLIA-PHILIPPINA RICE WEEDS 096 1968
FERRISIA-VIRGATA SOYBEAN KAKRI CUCUMIS-M 243 1974
FESTUCA-RUBRA AGROPYRON-CRISTATUM AGROPY 047 1967
FESTUCA-SPP. HORDEUM-MURINUM PANICUM-CRU 192 1969
FICUS-VOGELIANA LECANIODISCUS CUPANIOIDE 087 1973
FIELD-CROPS HELIANTHUS-PETIOLARIS COMPOS 232 1974
FIELD-CROPS WEEDS* HOMONNAY. ANOXIA-PIL 130 1978
FILIPENDULA-ULMARIA GLECHOMA-HEDERACEUM 196 1970
FIMBRISTYLIS-SP. ELEOCHARIS-SP. ELEUSINE 154 1968
FINCH. ACKLEY. ERIOISCHIA-BRASSICAE CAUL 097 1977
FLAX EGYPTIAN-CLOVER TRIFOLIUM-ALEXANDRI 148 1972
FLAX LINUN-USITATISSIMUM COTTON MAIZE LE 132 1969
FLAX TARAXACUM-OFFICINALE MELILOTUS-SP.* 136 1969
FLEMINGIA-CONGESTA SHADE-TREE URENA-LOBA 072 1974
FLESSEL. HYPERA-VARIABILIS-(HBST.)-POSTI 201 1970

FOOTT. SOLANUM-CAROLINENSE ZONOSEMATA-EL 098 1968
FOOTT. TIMMINS. GLISCHROCHILIS-QUADRISIG 099 1971
FORAGE-GRASSES* GUAGLIUMI. MARQUES. MEN 119 1969
FORFICULA-TOMIS POTATO SUNFLOWER HELIANT 190 1968
FOX. COSMOBARIS-AMERICANA SUGARBEETS AMA 163 1970
FOX. MACROSIPHUM-EUPHORBIAE ROSES ROSA W 164 1972
FRAGARIA-CHILENSIS-VAR.-ANANASSA PLANTAG 133 1970
FRANKLINIELLA-BREVICAULIS MAIZE BANANA C 011 1978
FRERIKS. NAPOMYZA CHICORY CARROTS CAMOMI 242 1975
FRUIT VEGETABLE* FOOTT. TIMMINS. GLISCH 099 1971
FRUMENTA-NUNDINELLA TRICHOBARIS-TRINOTAT 098 1968
FUKAMI. ISHII. NILAPARVATA-LUGENS LAODEL 153 1975
FUMARIA-INDICA CHENOPODIUM-ALBUM CYNODON 150 1969
FURTUNOV. HAPLODIPLOSIS-EQUESTRIS HAPLOD 100 1976
GALIUM-APARINE LEPIDIUM-SMITHII MALVA-SP 128 1965
GALIUM-APARINE* LOWE. MACROSIPHUM-MISCA 170 1969
GALIUM-SCHULTESII VERONICA CHAMAEDRYS WI 282 1966
GALLEGO. AELIA-RUSTRATA AELIA-ACUMINATA 101 1975
GAMEEL. BEMISIA-TABACI COTTON GROUNDNUTS 102 1972
GANTHORA DIOSCOREA-ESCULENTA CAULIFLOWER 243 1974
GAPONOVA. ZHUKOVA. STRUKOVA. PEMPHIGUS-F 103 1975
GARGAV. KATIYAR. PATEL. MYTHIMNA-(PSEUDA 104 1972
GAURA-BRACHYCARPA PARTHENIUM-HYSTEROPHOR 247 1969
GAURA-VILLOSA GAURA-BRACHYCARPA PARTHENI 247 1969
GENDUSO. AELIA-RUSTRATA WHEAT DOLYCORIS- 105 1977
GENDUSO. DIMARTINO. WHEAT AELIA-ROSTRATA 106 1978
GENISTA-SPP. ARCTOSTAPHYLOS-UVA-URSI WIL 101 1975
GERANIUM-CAROLINIANUM IPOMOEA-BATATAS LA 237 1971
GERANIUM-PUSILLUM* MULLER. AULACORTHUM- 196 1970
GLADIOLUS-SP. LACTUCA-PULCHELLA LAMIUM-A 164 1972
GLECHOMA-HEDERACEUM MELANDRIUM-ALBUM POT 196 1970
GLISCHROCHILIS-QUADRISIGNATUS MAIZE FRUI 099 1971
GLOBE-ARTICHOKE SAFFLOWER* PESCHKEN. II 210 1977
GLYCYRRHIZA-LEPIDOTA VICIA-FABA MEDICAGO 173 1977
GLYSINE-MAX GOSSYPIUM-HIRSUTUM HELIANTHU 237 1971
GNAPHALIUM-INDICUM CITRUS-BLOSSOM-MIDGE* 212 1968
GNORIMOSCHEMA-ABSOLUTA TOMATO POTATO LYC 275 1970
GUEDEN. SALSOLA-KALI-VAR.TENUIFOLIA* GO 107 1968
GOKSU. ATAK. TETRANYCHUS-URTICAE THRIPS- 108 1972
GOKULPURE. PHYTOMYZA-ATRICORNIS PHYTOMYZ 109 1972
GOLIKOV. KOSMACHEVSKII. CHENOPODIUM-SPP. 110 1972
GONIOCTENA-FURNICATA PHYTODECTA-FORNICAT 046 1976
GORBATYUK. SUGARBEET PEMPHIGUS-FUSCICORN 111 1971
GORDON. TAYLOR. PHYLLOCOPTES-(ERIOPHYES) 112 1976
GORZ. STEVENS. WALSHIA-MISCECOLORELLA SW 179 1971
GOSSYPIUM-ANOMALUM* CADEILHAN-GIRAUDET. 051 1968
GOSSYPIUM-BARBADENSE HIBISCUS-ESCULENTUS 076 1971
GOSSYPIUM-HIRSUTUM HELIANTHUS-ANNUUS HOR 237 1971
GOSSYPIUM-STURTII BRACHYCHITON-SP.* SHA 249 1970
GONDA. LEONONDRA-VITTATA RICE IMPERATA-C 221 1975
GRAHAM. PSALLUS-(PSEUDATOMOSCELIS)-SERIA 247 1969
GRAHAM. ROBERTSON. HELIOTHIS-VIRESCENS H 113 1970
GRAIN CLOVERS GRASSES VEGETABLE-CROPS CA 123 1973
GRAIN-CROPS* WERNER. RIOUX. AGROPYRON-R 286 1977
GRAIN-SORGHUM CORN STRING-BEANS BLACKEYE 113 1970
GRAMINACEAE COMPOSITAE WHEAT BARLEY AVEN 148 1972

GRAMINACEAE CYPERACEAE* TENORIO. MANAZE 270 1970
GRAMINACEAE FORAGE-GRASSES* GUAGLIUMI. 119 1969
GRAMINACEAE SORGHUM MAIZE RICE WEEDS DIG 065 1973
GRAMINACEOUS-CROPS POLYGONUM-SP. TYPHA-S 073 1971
GRAMINACEOUS-SPECIES* REIS. COSTA. LOBA 229 1976
GRAMINEAE COMPOSITAE ABELMOSCHUS-ESCULEN 237 1971
GRAMINEAE CYPERACEAE JUNCACEAE WHEAT BAR 182 1972
GRAMINEAE GREWIA-HIRSUTA BARLERIA-PRIONI 161 1975
GRAMINEAE JUNCACEAE CYPERACEAE MACROSIPH 225 1970
GRANADOS. DIGITARIA-ADSCENDENS BRACHIARI 114 1972
GRAPES* BARNES. NYSIUS-RAPHANUS SISYMBR 028 1970
GRAPEVINE CONYZA-AMBIGUA* PUTTARUDRIAH. 215 1976
GRAPEVINE WEEDS CORVUS-FRUGILEGUS* MERL 186 1977
GRAPEVINES GRASSES WILD-PLANTS RUBUS VIT 284 1967
GRAPEVINES VITIS-CARIBAEA VITIS-TILIIFOL 239 1969
GRAPHIPHORA-AUGUR TRIPAENA-AUGUR XESTIA- 198 1976
GRAPHIPHORA-C-NIGRUM POLIA-BOMBYCINA AMP 198 1976
GRASS* CARNEGIE. NUMICIA-VIRIDIS SUGARC 053 1969
GRASSES ACERIA-TENUIS AGROPYRON-REPENS A 047 1967
GRASSES CEREALS WHEAT AVENA-SP. TRITICUM 170 1969
GRASSES HERBACEOUS-PLANTS* GENDUSO. DIM 106 1978
GRASSES LAMIUM-AMPLEXICAULE STELLARIA-ME 201 1970
GRASSES MEROMYZA-SALTATRIX POA-SPP. AGRO 094 1969
GRASSES PADDY* ANONYMOUS. THRIPS-ORYZAE 019 1976
GRASSES PEARL-MILLET PENNISETUM-TYPHOIDE 241 1975
GRASSES RHOPALOSIPHUM-(LIPAPHIS)-ERYSIM 287 1967
GRASSES RUSHES SEDGES* RAVTAPAA. GRAMIN 225 1970
GRASSES SEDGES MAIZE* CARNEGIE. NUMICIA 052 1967
GRASSES VEGETABLE-CROPS CARROTS POTATOES 123 1973
GRASSES WHEAT BARLEY RYE OATS MAIZE MILL 199 1968
GRASSES WHEAT OATS BARLEY APPLE GALIUM-A 170 1969
GRASSES WILD-PLANTS RUBUS VITIS* VIDANO 284 1967
GRASSES* BUTANI. CHILO-INFUSCATELLUS SU 050 1969
GRASSES* DUSEK. CEREAL HYLEMYA-(PHORBIA 085 1969
GRASSES* KONDAKOV. NUGINA. POTATO HOPS 157 1968
GRASSES* MIKHAILOVA. TRIGONOTYLUS-RUFIC 189 1970
GRASSES* OLMI. RICE TETTIGELLA-(CICADEL 203 1968
GREENE. TRICOPLUSIA-NI PSEUDOPLUSIA-INCL 183 1976
GREWIA-HIRSUTA BARLERIA-PRIONITIS* LAL. 161 1975
GRIGOROV. APPLE ANURAPHIS-(DYSAPHIS)-DEV 115 1972
GRIGORUV. PEMPHIGUS-FUSCICORNIS SUGARBEE 116 1977
GRIGOROV. PEMPHIGUS-FUSCICORNIS CHENOPOD 117 1968
GROMADZKA. RYE APERA-SPICA-VENTI SCLERAN 118 1970
GROUNDNUT PEANUT ARACHIS-HYPOGAEA INDIGO 223 1977
GROUNDNUTS KENAF HIBISCUS-CANNABINUS PEP 102 1972
GTENICERA-(CORYMBITES)-INCANA CEREALS ME 160 1975
GUAGLIUMI. MARQUES. MENDONCA-FILHO. AENE 119 1969
GUENCHEV. AGROTIS-SEGETUM LUCERNE SONCHU 120 1968
GUENCHEV. AGROTIS-SEGETUM WEEDS* GUENCH 121 1971
GUERRA. GUTARRA. NASONOVIA-RIBISNIGRI WI 274 1976
GURSES. SITONA-CRINITUS PHYLLOBIUS-ARGEN 004 1972
GUTARRA. NASONOVIA-RIBISNIGRI WILD-COMPO 274 1976
GYMNOSOMA* GENDUSO. AELIA-ROSTRATA WHEA 105 1977
GYNANDROPSIS-PENTAPHYLLA HELIOTROPIUM-IN 030 1969
GYNERIUM-SAGITTATUM* QUINTANA-MUNIZ. WA 217 1970
HABIBI. BEMISIA-TABACI COTTON CONVOLVULU 122 1975

HAGEL. LANDIS. AHRENS. MACROSTELES-FASCI	123	1973
HALLOCK. CHENOPODIACEAE CRUCIFERS CIRCUL	081	1957
HALOGETON-GLOMERATUS HELIANTHUS-TUBEROSU	163	1970
HAMMAD. RAAFAT. VANESSA-(PYRAMEIS)-CARDU	124	1973
HAPANOVA. PEMPHIGUS-FUSCICORNIS SUGARBEE	178	1966
HAPLAXIUS-CRUDUS ST.-AUGUSTINE-GRASS CHR	228	1977
HAPLAXIUS-CRUDUS STENOTAPHRUM-SECUNDATUM	273	1978
HAPLODIPLOSIS-EQUESTRIS WHEAT BARLEY AGR	091	1970
HAPLODIPLOSIS-EQUESTRIS HAPLODIPLOSIS-MA	100	1976
HAPLODIPLOSIS-MARGINATA BARLEY WHEAT CER	008	1968
HAPLODIPLOSIS-MARGINATA WHEAT MAIZE PHAS	100	1976
HAPLOTHRIPS-GANGLBAUERI ORYZA-SATIVA ECH	006	1976
HARDING. HELIOTHIS-ZEA HELIOTHIS-VIRESCE	125	1976
HARDING. SPODOPTERA-EXIGUA PLUTELLA-XYLO	126	1976
HASSAN. ATTIA. HYALOPTERUS-PRUNI PEACH A	088	1971
HATCHETT. DAUGHERTY. ROBBINS. BARRY. HOU	127	1975
HAZEL CORYLUS-AVELLANA PARORNIX-AVELLANE	077	1971
HAZEL CORYLUS-AVELLANA FALSE-ACACIA ROBI	251	1976
HAZEL SUNFLOWER OCIMUM-BASILICUM WEEDS*	213	1974
HEATHCOTE. DUNNING. WOLFE. SUGARBEET MAC	128	1965
HELENIUM-AUTUMNALE CIRSIUM-DISCOLOR CIRS	218	1978
HELIANTHUS* COSTILLA. MERCADO. SPODOPTE	066	1968
HELIANTHUS-ANNUUS ARACHIS-HYPOGAEA* BON	038	1969
HELIANTHUS-ANNUUS AMARANTHUS-RETROFLEXUS	078	1969
HELIANTHUS-ANNUUS PASSIFLORA-FOETIDA ABU	113	1970
HELIANTHUS-ANNUUS SETARIA-FABERII APOCYN	137	1971
HELIANTHUS-ANNUUS CABBAGE TOMATOES CUCUM	190	1968
HELIANTHUS-ANNUUS THRIPS-TABACI-PULLUS T	220	1974
HELIANTHUS-ANNUUS AMARANTHUS-PALMERI AMA	232	1974
HELIANTHUS-ANNUUS HORDEUM-VULGARE LATHYR	237	1971
HELIANTHUS-ANNUUS* SCHUSTER. RICHMOND.	247	1969
HELIANTHUS-ANNUUS* TAPIA. SUNFLOWER BEM	267	1968
HELIANTHUS-HIRSUTUS ERIGERON-ANNUUS HELI	218	1978
HELIANTHUS-PETIOLARIS COMPOSITAE HELIANT	232	1974
HELIANTHUS-SPP. HUSK-TOMATO PASSIFLORA-S	125	1976
HELIANTHUS-SPP. LACTUCA-SP. LEPIDIUM-SPP	126	1976
HELIANTHUS-TUBEROSUS SALSOLA-KALI-VAR-TE	163	1970
HELIANTHUS-TUBEROSUS EUPATORIUM-PURPUREU	218	1978
HELIOPSIS-HELIANTHOIDES-VAR.-SCABRA CONV	068	1972
HELIOTHIS-ARMIGERA CHLORIDEA-OBSOLETA SP	003	1971
HELIOTHIS-ARMIGERA COTTON SORGHUM MAIZE	233	1974
HELIOTHIS-ARMIGERA MOMORDIAC-CHARANTIA C	258	1976
HELIOTHIS-VIRESCENS HELIOTHIS-ZEA NICOTI	113	1970
HELIOTHIS-VIRESCENS CORN COTTON SORGHUM	125	1976
HELIOTHIS-VIRESCENS* LASTER. MARTIN. PA	165	1976
HELIOTHIS-VIRESCENS HELIOTHIS-ZEA CABBAG	183	1976
HELIOTHIS-VIRESCENS HELIOTHIS-ZEA* SNOW	253	1967
HELIOTHIS-ZEA COTTON* KRAEMER. MALVASTR	159	1966
HELIOTHIS-ZEA CABBAGE COLLARDS SOYBEANS	183	1976
HELIOTHIS-ZEA HELIOTHIS-VIRESCENS CORN C	125	1976
HELIOTHIS-ZEA NICOTIANA-REPANDA LUCERNE	113	1970
HELIOTHIS-ZEA SPODOPTERA-EXIGUA SPANAGUN	216	1975
HELIOTHIS-ZEA* SNOW. BURTON. DESMODIUM-	253	1967
HELIOTROPIUM-INDICUM COWPEA CUCURBITS CA	030	1969
HEMARTHRIA-COMPRESSA CYPERUS-ROTUNDUS SO	134	1976
HERACLEUM-SPONDYLIUM PIMPINELLA-SAXIFRAF	156	1972

HERBACEOUS-PLANTS* GENDUSO. DIMARTINO.	106	1978
HIBISCUS-CANNABINUS COTTON GOSSYPIUM-BAR	076	1971
HIBISCUS-CANNABINUS PEPPER CAPSICUM-ANNU	102	1972
HIBISCUS-CANNABINUS MALVACEAE KERRIE-JAP	200	1970
HIBISCUS-ESCULENTUS MALVA-ROTUNDIFOLIA H	076	1971
HIBISCUS-ESCULENTUS COTTON KAPOK CEIBA-P	090	1970
HIBISCUS-HETEROPHYLLUS HIBISCUS-TILIACEU	249	1970
HIBISCUS-SABDARIFFA SIDA-MOLLIS HIBISCUS	076	1971
HIBISCUS-SPP. ABUTILON-SPP. WALTHERIA-IN	227	1977
HIBISCUS-SYRIACUS CELESTRUS-ORBICULATUS	133	1970
HIBISCUS-TILIACEUS THESPESIA-POPULNEA CO	238	1969
HIBISCUS-TILIACEUS MALVASTRUM-COROMANDEL	249	1970
HIBISCUS-TRIONUM SPHOERALCEA-UMBELLATA A	076	1971
HIBISCUS-TRIONUM ABUTILON-AVICENNAE* FA	092	1977
HIBISCUS-TRIONUM MALVA-PARVIFLORA PAVONI	249	1970
HISPA-(DICLADISPA)-ARMIGERA DICLADISPA-(	248	1970
HOKYO. UTAKE. OKADA. NEPHOTETTIX-NIGROPI	129	1977
HOLOSTEUM-UMBELLATUM LUCERNE HYPERA-VARI	032	1969
HOLOTRICHIA-SERRATA LACHNOSTERNA-(HOLOTR	279	1971
HOMONNAY. ANOXIA-PILOSA ORCHARDS VINEYAR	130	1978
HOMOROCORYPHUS-NITIDULUS RICE CITRUS TEA	146	1971
HOPPERS RICE NEPHOTETTIX-CINCTICEPS NEPH	056	1969
HOPS HYDRAECIA-MICACEA WILD-GRASSES* BE	034	1976
HOPS HYDRAECIA-MICACEA GRASSES* KONDAKO	157	1968
HOPS PHORODON-HUMULI PLUMS PSYLLIODES-AT	268	1976
HORDEUM-MURINUM* BUHL. ACERIA-(ERIOPHYT	047	1967
HORDEUM-MURINUM PANICUM-CRUS-GALLI POA-S	192	1969
HORDEUM-VULGARE LATHYRUS-ODORATUS LOLIUM	237	1971
HOSTS TETRANYCHUS-TELARIUS TETRANYCHUS-U	061	1972
HOUSER. DECTUS-TEXANUS SOYBEAN AMBROSIA-	127	1975
HOWE. RHODES. MELITTIA-CUCURBITAE CUCURB	131	1973
HUSK-TOMATO PASSIFLORA-SP.* HARDING. HE	125	1976
HYALOPTERUS-PRUNI PEACH APRICOTS PHRAGMI	088	1971
HYALOPTERUS-PRUNI PRUNUS-DOMESTICA PRUNU	252	1970
HYDRAECIA-MICACEA WILD-GRASSES* BERIM.	034	1976
HYDRAECIA-MICACEA GRASSES* KONDAKOV. NO	157	1968
HYDRELLIA-GRISEOLA AGROMYZA-ORYZAE WILD-	155	1971
HYDRELLIA-PHILIPPINA RICE WEEDS BRACHIAR	096	1968
HYLEMYA-(LEPTOHYLEMYIA)-COARCTATA AGROPY	250	1969
HYLEMYA-(PHORBIA)-COARCTATA WHEAT RYE BA	085	1969
HYMENACHNE-AMPLEXICAULIS GYNERIUM-SAGITT	217	1970
HYMENIA-RECURVALIS TRIANTHEMA-MONOGYNA A	055	1977
HYOSCYAMUS-ALBUS LYCIUM-EUROPEUM DATURA-	067	1969
HYPERA-SP. SITONA-SP. RED-CLOVER TRIFOLI	209	1971
HYPERA-VARIABILIS POSTICA* BEN-SAAD. BI	032	1969
HYPERA-VARIABILIS-(HBST.)-POSTICA LUCERN	201	1970
HYPOCASSIDA-SUBFERRUGINEA CASSIDA-BEROLI	045	1968
HYUN. PARK. LAODELPHAX-STRIATELLA AGROPY	060	1975
IBRAHIM. PHRGOMORPHA-CONICA BROAD-BEANS	132	1969
ICHIKAWA. FUKAMI. ISHII. NILAPARVATA-LUG	153	1975
IMPATIENS* LAL. ALTICA-CAERULESCENS MAC	162	1977
IMPERATA-CYLINDRICA* IBRAHIM. PHRGOMORP	132	1969
IMPERATA-CYLINDRICA MELANITIS-LEDA RESER	181	1977
IMPERATA-CYLINDRICA* RAI. GOWDA. LEONON	221	1975
IMPERATA-CYLINDRICA ANDROPOGON-SP.* VER	283	1976
INAIZUMI. APHIS-GOSSYPII VEGETABLE-CROPS	133	1970

INDIGOFERA-HIRSUTA PHASEOLUS-CALCARATUS	223	1977
INYANG. EPILACHNA-SIMILIS MAIZE RICE SUG	245	1974
IPOMOEA-BATATAS LANTANA-CAMARA LEPIDIUM-	237	1971
IPOMOEA-PURPUREA* PUSCHING. TURPIN. AGR	214	1977
IQBAL. AZIZ. SPATHOSTERNUM-PRASINIFERUM	134	1976
ISA. AWADALLAH. CNEPHASIA-PUMICANA CRUCI	148	1972
ISCHAEMUM-ARISTATUM PACHYDIPLOSIS-ORYZAE	272	1974
ISHII. NILAPARVATA-LUGENS LAODELPHAX-STR	153	1975
ISRAEL. CIRPHIS-COMPTA SPODOPTERA-(CIRPH	144	1971
ISRAEL. LEPTOCORISA-VARICORNIS LEPTOCORI	143	1969
ISRAEL. RAO. DICLADISPA-ARMIGERA RICE PA	211	1977
IVANNIKOV. CENTAUREA-REPENS PHYTOMYZA*	135	1969
JACOBSON. EUXOA-TRISTICULA SUGARBEET WEE	136	1969
JACQUES. PETERS. SYSTENA-FRONTALIS CORN	137	1971
JADOT. ROLAND. BEET SENECIO-VULGARIS VER	138	1971
JALAMKAR. BORLE. BODHADE. DYSDERCUS-CING	139	1974
JALAMKAR. BORLE. BODHADE. DYSDERCUS-CING	140	1975
JANAKE. SUBRAMANIAM. CNAPHALOCROCIS-MEDI	280	1973
JOLIVET VANPARYS.* OUATTARA. JOLIVET VA	204	1977
JOOS. BEARDEN. BERLOWITZ. PEAR EUSCHISTU	029	1976
JOSHI. PETROBIA-LATENS BARLEY WHEAT CITR	150	1969
JOWAR OLIGONYCHUS-(PARATETRANCYCHUS)-IND	149	1956
JUNCACEAE CYPERACEAE MACROSIPHUM-AVENAE	225	1970
JUNCACEAE WHEAT BARLEY OATS AVENA-FATUA	182	1972
JUTE CORCHORUS-ACUTANGULUS WILD-MALVACEO	090	1970
KABASINSKAITE. ZAJANCKAVSKAS. SIMAETHIS-	141	1970
KAJITA. TRIALEURODES-VAPORARIORUM WEEDS*	142	1977
KAKRI CUCUMIS-MELO POYEE BASELLA-ALBA GA	243	1974
KALODE. VARMAD. YADAVA. ISRAEL. CIRPHIS-	144	1971
KALODE. YADAVA. ISRAEL. LEPTOCORISA-VARI	143	1969
KANDASAMY. BALIOTHRIPS-UZEL MAIZE WEED-H	005	1977
KAPIL. HYMENIA-RECURVALIS TRIANTHEMA-MON	055	1977
KAPOK CEIBA-PENTANDRA KENAF JUTE CORCHOR	090	1970
KARALOASH. PRIKHOD'KO. TKACHEV. LOSHITSK	145	1971
KAS'YANOV. HOMOROCORYPHUS-NITIDULUS RICE	146	1971
KAS'YANOV. RICE SCHIZAPHIS-(TOXOPTERA)-G	147	1970
KATIYAR. PATEL. MYTHIMNA-(PSEUDALETIA)-S	104	1972
KENAF HIBISCUS-CANNABINUS PEPPER CAPSICU	102	1972
KENAF JUTE CORCHORUS-ACUTANGULUS WILD-MA	090	1970
KENAF* LESTON. OXYCARENUS-FIEBERI SIDA-	167	1970
KERRIE-JAPONICA ROSACEAE* EL-S-NASR. NA	200	1970
KHALIFA. ISA. AWADALLAH. CNEPHASIA-PUMIC	148	1972
KHAN. DOVAL JOSHI. PETROBIA-LATENS BARLE	150	1969
KHAN. MURTHY. DICANTHIUM-ANNULATUM JOWAR	149	1956
KHATRI. MARASMIA-TRAPEZALIS BRACHIARIA-M	208	1975
KIER-BYERLY. SOSA-MOSS. EPILACHNA-VARIVE	151	1967
KILIC. EURYGASTER-INTEGRICEPS CEREAL TRI	152	1967
KIM. KOH. ICHIKAWA. FUKAMI. ISHII. NILAP	153	1975
KING. RICE CYPERACEAE CYPERUS-SP. FIMBRI	154	1968
KIRSCH. HAPLAXIUS-CRUDUS STENOTAPHRUM-SE	273	1978
KLIMANOVA. RICE HYDRELLIA-GRISEOLA AGROM	155	1971
KNOL-KOHL BRASSICA-OLERACEA-VAR.-CAULORA	197	1969
KNOL-KOHL CONVOLVULUS-ARVENSIS CARROT NA	030	1969
KOCHIA-AMERICANA ALFALFA SOYBEANS SWISS-	163	1970
KOH. ICHIKAWA. FUKAMI. ISHII. NILAPARVAT	153	1975
KOLESOVA. ANURAPHIS-FARFARAE ANURAPHIS-P	156	1972

KONDAKOV. NOGINA. POTATO HOPS HYDRAECIA- 157 1968
KONTEV. ORIA-MUCULOSA WHEAT BARLEY OATS 158 1973
KONTEV. PENTHALEUS-MAJOR WHEAT POA-BULBO 023 1969
KOSMACHEVSKII. CHENOPODIUM-SPP. BEETS SU 110 1972
KRAEMER. MALVASTRUM-SPICATUM MELANTHERA- 159 1966
LABIATAE CHENOPODIACEAE CARYOPHYLLACEAE 045 1968
LACANOBIA-THALASSINA MAMESTRA-THALASSINA 198 1976
LACHNOSTERNA-(HOLOTRICHIA)-SERRATA SUGAR 279 1971
LACTUCA-CANADENSIS SISYMBRIUM-ALTISSIMUM 123 1973
LACTUCA-FLORIDANA HELENIUM-AUTUMNALE CIR 218 1978
LACTUCA-PULCHELLA LAMIUM-AMPLEXICAULE LE 164 1972
LACTUCA-SP. LEPIDIUM-SPP. NICOTIANA-SP. 126 1976
LAGGERA-AURITA* SUBBA-RAO. RANGARAJAN. 258 1976
LAIRD. SORGHUM SCHIZAPHIS-GRAMINUM OATS 075 1969
LAITINEN. KAATIKAINEN. OATS CHAETONEMA- 160 1975
LAL. ALTICA-CAERULESCENS MACRIMA-ARMATA 162 1977
LAL. MUKHARJI. LEPTOCORISA-ACUTA RICE BL 161 1975
LAMIUM-AMPLEXICAULE MATRICARIA-MATRICARI 032 1969
LAMIUM-AMPLEXICAULE LEPIDIUM-PERFOLIATUM 164 1972
LAMIUM-AMPLEXICAULE STELLARIA-MEDIA* NI 201 1970
LANDIS. AHRENS. MACROSTELES-FASCIFRONS G 123 1973
LANDIS. PEAY. FOX. COSMOBARIS-AMERICANA 163 1970
LANDIS. POWELL. FOX. MACROSIPHUM-EUPHORB 164 1972
LANTANA EUPATORIUM* DHANARAJAN. ENDOCLI 074 1976
LANTANA-CAMARA RED-SPIDER-MITE WEEDS* C 061 1972
LANTANA-CAMARA LEPIDIUM-VIRGINICUM ORONT 237 1971
LANTANA-SP. ORTHEZIA-PARAGRAMINIS PANICU 031 1969
LAODELPHAX-STRIATELLA NEPHOTETTIX-CINCTI 059 1976
LAODELPHAX-STRIATELLA AGROPYRON-KAMIJO* 060 1975
LAODELPHAX-STRIATELLA SOGATELLA-FURCIFER 153 1975
LAPHYGMA-EXIGUA SPODOPTERA-(LAPHYGMA)-EX 197 1969
LARINUS-CYNARAE PYRODERCES-ARGYROGRAMMOS 257 1968
LARINUS-CYNARAE PYRODERCES-ARGYROGRAMMOS 257 1968
LARINUS-SCOLYMI LARINUS-CYNARAE PYRODERC 257 1968
LASERPITIUM-HISPIDUM PASTINACA-SATIVA HE 156 1972
LASTER. MARTIN. PAIR. SICYOS-ANGULATA HE 165 1976
LATHYRUS-ODORATUS LOLIUM-TEMULENTUM MELI 237 1971
LATHYRUS-PRATENSIS LOTUS-CORNICULATUS ME 222 1969
LATHYRUS-VENOSUS GLYCYRRHIZA-LEPIDOTA VI 173 1977
LAUNEA-NUDICULUS* SRVASTAVA. PANDEY. UN 254 1968
LAWN-GRASSES RYE CORN ERIGERON-SPP. AMBR 123 1973
LAWNS CYNODON ECHINOCHLOA CYPERUS* DEAN 071 1968
LEAF-MINERS HAZEL CORYLUS-AVELLANA PAROR 077 1971
LECANIODISCUS CUPANIOIDES LEEA-GUINEENSI 087 1973
LEE. LAODELPHAX-STRIATELLA NEPHOTETTIX-C 059 1976
LEEA-GUINEENSIS RAUWOLFIA-VOMITORIA SOLA 087 1973
LEERSIA-HEXANDRA LEPTOCHLOA-CHINENSIS PA 096 1968
LEERSIA-HEXANDRA* SEN. CHAKROVORTY. HIS 248 1970
LEERSIA-JAPONICA GRASSES PADDY* ANONYMO 019 1976
LEGUMINOSAE AMARANTHUS-RETROFLEXUS ALHAG 244 1973
LEGUMINOSAE BORRAGINACEAE* TALHOUK. DID 264 1977
LEGUMINOSAE GRAMINACEAE COMPOSITAE WHEAT 148 1972
LEGUMINOSAE MALVACEAE GRAMINEAE COMPOSIT 237 1971
LEGUMINOSAE MELILOTUS-SPP. RED-CLOVER TR 179 1971
LEGUMINOSAE VERBENACEAE MORACEAE EUPHORB 069 1968
LEMON CITRUS-MEDICA* PANDEY. BOGAWAT. P 205 1969
LENS-CULINARIS MEDICAGO-SATIVA MELILOTUS 244 1973

LENS-ESCULENTA WHEAT BARLEY CYNODON-DACT	132	1969
LENTIL LENS-ESCULENTA WHEAT BARLEY CYNOD	132	1969
LEONONDRA-VITTATA RICE IMPERATA-CYLINDRI	221	1975
LEPIDIUM-CAMPESTRE DESCURAINIA-INCISUM L	032	1969
LEPIDIUM-PERFOLIATUM LYCIUM-HALIMIFOLIUM	164	1972
LEPIDIUM-SMITHII MALVA-SPP. MELANDRIUM-A	128	1965
LEPIDIUM-SPP. NICOTIANA-SP. RUMEX-SP. SO	126	1976
LEPIDIUM-STATIVUM SISYMBRIUM-IRIO CORCHO	001	1972
LEPIDIUM-VIRGINICUM URONTIUM-AQUATICUM P	237	1971
LEPTINOTARSA-DECEMLINEATA SOLANUM TOMATO	039	1970
LEPTINOTARSA-DECEMLINEATA FRUMENTA-NUNDI	098	1968
LEPTOCHLOA-CHINENSIS PANICUM-REPENS PENN	096	1968
LEPTOCHLOA-FILIFORMIS LEERSIA-HEXANDRA*	248	1970
LEPTOCHLOA-SCABRA ECHINOCHLOA-COLONUM HY	217	1970
LEPTOCORIS-RUBROLINEATUS WEEDS RUMEX-SPP	029	1976
LEPTOCORISA-ACUTA ECHINOCHLOA-COLONUM RI	143	1969
LEPTOCORISA-ACUTA RICE BLUMEA-LACERA GRA	161	1975
LEPTOCORISA-VARICORNIS LEPTOCORISA-ACUTA	143	1969
LEROI. PHILOPHYLLA-HERACLEI CELERY EULEI	166	1976
LESTON. OXYCARENUS-FIEBERI SIDA-ACUTA SI	167	1970
LETHRUS-APTERUS MAIZE WEEDS* FED'KO. PI	093	1977
LETTUCE BELL-PEPPERS GRAIN-SORGHUM CORN	113	1970
LETTUCE ENDIVE CICHORIUM-ENDIVIA SONCHUS	242	1975
LETTUCE KNOL-KOHL BRASSICA-OLERACEA-VAR.	197	1969
LETTUCE POTATO MAIZE TOBACCO GRAPEVINE W	186	1977
LETTUCE SOYBEAN TOMATOES HELIANTHUS-SPP.	125	1976
LEUCINODES-ORBANALIS BRINJAL SOLANUM-MEL	070	1971
LEVI. OSORES. MOCIS-LATIPES SUGARCANE GR	065	1973
LEWIS. THRIPS-SPP.* LEWIS. THRIPS-SPP.*	168	1973
LIEBERMANN. ESPUL. MANSUR. MIOGRYLLUS-CO	169	1971
LINGREN. GREENE. TRICOPLUSIA-NI PSEUDOPL	183	1976
LINUN-USITATISSIMUM COTTON MAIZE LENTIL	132	1969
LOBATO. BLISSUS-LEUCOPTERUS BRACHIARIA-S	229	1976
LOLIUM-MULTIFLORUM RYEGRASS* DICKSON. L	075	1969
LOLIUM-PERENNE WHEATS* MITIC-MUZINA. BY	192	1969
LOLIUM-PERENNE* FEDOSEEVA. MEROMYZA-NIG	094	1969
LOLIUM-TEMULENTUM MELILOTUS-ALBA-VAR.-UB	237	1971
LOPP. AMBROSIA-TRIFIDA CAMPYLENCHIA-LATI	218	1978
LOQUAT ERIOBOTYRA-JAPONICA WALNUT CENOPA	020	1967
LOSHITSKII. APPLE AMETASTEGIA-GLABRATA O	145	1971
LOTUS-CORNICULATUS PHLEUM-PRATENSE* BAI	022	1976
LOTUS-CORNICULATUS TIMOTHY-GRASS PHLEUM-	026	1972
LOTUS-CORNICULATUS MEDICAGO-SP. MELILOTU	222	1969
LOWE. MACROSIPHUM-MISCANTHI GRASSES CERE	170	1969
LOXOSTEGE-STICTICALIS WHEAT WEEDS* SVET	261	1977
LUCERNE AMARANTHUS LYGUS-SPP. HELIOTHIS-	216	1975
LUCERNE BREVICORYNE-BRASSICAE CABBAGE SI	274	1976
LUCERNE COTTON CUCUMBER BEANS PHASEOLUS-	278	1970
LUCERNE HYPERA-VARIABILIS POSTICA* BEN-	032	1969
LUCERNE LETTUCE POTATO MAIZE TOBACCO GRA	186	1977
LUCERNE MELILOTUS-ALBA MELILOTUS-HIRSUTA	179	1971
LUCERNE SONCHUS-ARVENSIS CABBAGE ONION C	120	1968
LUCERNE SOYBEAN SUNFLOWERS HELIANTHUS*	066	1968
LUCERNE SUNFLOWER HELIANTHUS-ANNUUS AMAR	078	1969
LUCERNE TOMATO COTTON OKRA VERBENA-SP. S	113	1970
LUCERNE TRIFOLIUM-PRATENSE GRASSES LAMIU	201	1970

LUCERNE WEEDS COMPOSITAE UMBELLIFERAE*	174	1968
LUCERNE* CHAUDHARY, KAPIL, HYMENIA-RECU	055	1977
LUDWIGIA-LYSSOPIFOLIA SOLANUM-NIGRUM MIR	035	1972
LUPERODES-SP, CHAETOCNEMA-BASALIS GYNAND	030	1969
LUPIN LUPINUS-TERMIS FLAX LINUN-USITATIS	132	1969
LUPIN* HAMMAD, KAAFAT, VANESSA-(PYRAMEI	124	1973
LUPINUS-SP, ASTRAGALUS-SP.* MANGLITZ, G	179	1971
LUPINUS-TERMIS FLAX LINUN-USITATISSIMUM	132	1969
LYCIUM-EUROPEUM DATURA-SUAVEOLENS PHYSAL	067	1969
LYCIUM-HALIMIFOLIUM MALVA-ROTUNDIFOLIA R	164	1972
LYCOPERSICON-ESCULENTUM TOMATO NICOTIANA	067	1969
LYCOPERSICUM SOLANACEAE VEGETABLES* MCD	184	1971
LYCOPERSICUM-PUBERULUM SOLANUM-NIGRUM DA	275	1970
LYGUS-RUGULIPENNIS SUGARBEET TURNIP-RAPE	276	1972
LYGUS-SPP, HELIOTHIS-ZEA SPODOPTERA-EXIG	216	1975
LYSIMACHIA-VULGARIS* THOMAS, APHIS-FRAN	271	1969
MACCI, MUNSHI, NEZARA-VIRIDULA POTATO CL	171	1972
MACELJSKI, BALARIN, AUTOGRAPHA-GAMMA PIN	172	1972
MACFARLANE, THORSTEINSON, MELANOPLUS-BIV	173	1977
MACRIMA-ARMATA WILLOW SALIX-ALBA ALNUS-N	162	1977
MACROSIPHUM-(SITOBION)-AVENAE CAPSELLA-B	289	1972
MACROSIPHUM-AVENAE GRAMINEAE CYPERACEAE	182	1972
MACROSIPHUM-AVENAE RHOPALOSIPHUM-PADI CE	225	1970
MACROSIPHUM-AVENAE METOPOLOPHIUM-DIRHODU	274	1976
MACROSIPHUM-EUPHORBIAE RHOPALOSIPHUM-RUF	009	1969
MACROSIPHUM-EUPHORBIAE* JADOT, ROLAND,	138	1971
MACROSIPHUM-EUPHORBIAE ROSES ROSA WEEDS	164	1972
MACROSIPHUM-EUPHORBIAE AULACORTHUM-SOLAN	274	1976
MACROSIPHUM-MISCANTHI GRASSES CEREALS WH	170	1969
MACROSIPHUM-SLOANIFOLII MYZUS-PERSICAE M	128	1965
MACROSTELES-FASCIFRONS GRAIN CLOVERS GRA	123	1973
MACROSTELES-SEXNOTATUS GRASSES* OLMI, R	203	1968
MADDUX, SIMYRA-HENRICI CORN GRAMINACEOUS	073	1971
MAIZE ALOPECURUS-PRATENSIS AVENA-FATUA B	192	1969
MAIZE BANANA CLERODENDRON FABACEAE* ANU	011	1978
MAIZE BORRERIA-HISPIDA BALIOTHRIPS-HOLOR	005	1977
MAIZE CYNODON-DACTYLON ECHINOCHLOA-CRUS-	075	1969
MAIZE FRUIT VEGETABLE* FOOTT, TIMMINS,	099	1971
MAIZE GRASSES* MIKHAILOVA, TRIGONOTYLUS	189	1970
MAIZE LENTIL LENS-ESCULENTA WHEAT BARLEY	132	1969
MAIZE MILLET RICE AGROPYRON-REPENS* NAR	199	1968
MAIZE OATS CEREALS WILD-GRASSES REEDS AR	036	1970
MAIZE PANICUM-SP.* DURANT, OSTRINIA-NUB	084	1969
MAIZE PARTHENIUM-SP, PORTULACA-SPP, SOYB	126	1976
MAIZE PENNISETUM-PURPUREUM SORGHUM SUGAR	217	1970
MAIZE PENNISETUM-AMERICANUM ECHINOCHLOA-	226	1977
MAIZE PHASEOLUS WEEDS AVENA-SPP, SETARIA	100	1976
MAIZE POLYGONUM-PENNSYLVANICUM AMARANTHU	137	1971
MAIZE RICE SUGARCANE SORGHUM WHEAT PENNI	245	1974
MAIZE RICE WEEDS DIGITARIA-SANGUINALIS*	065	1973
MAIZE SORGHUM CLOVER BIRDSFOOT-TREFOIL L	026	1972
MAIZE SORGHUM OATS BARLEY GRASSES* BUTA	050	1969
MAIZE SORGHUM PEARL-MILLET PENNISETUM-AM	134	1976
MAIZE SORGHUM SUGARCANE LUCERNE SOYBEAN	066	1968
MAIZE SUGARCANE SORGHUM SORGHUM-HALEPENS	241	1975
MAIZE SUNFLOWER* ROOME, HELIOTHIS-ARMIG	233	1974

MAIZE TOBACCO GRAPEVINE WEEDS CORVUS-FRU 186 1977
MAIZE VEGETABLE-CROPS WEED* NIKOLOVA, A 202 1971
MAIZE WEED-HOSTS ECHINOCHLOA-COLONUM CYP 005 1977
MAIZE WEEDS* FED'KO, PISARENKO, LETHRUS 093 1977
MAIZE WHEAT TRITICUM-AESTIVUM RYE SECALE 073 1971
MAIZE* ABUL-NASR, EL-SHERIF, NAGUIB, SP 001 1972
MAIZE* BATRA, VEGETABLES CEREALS PSYLLI 030 1969
MAIZE* BRANSON, URTMAN, DIABROTICA-LONG 044 1967
MAIZE* CARNEGIE, NUMICIA-VIRIDIS SUGARC 052 1967
MAIZE* MOIZ, NAGVI, ATHERIGONA-VARIA-VA 193 1969
MAKAROV, LUCERNE WEEDS COMPOSITAE UMBELL 174 1968
MALLOW ARTICHOKE CYNARA THISTLE CLOVER N 124 1973
MALVA-PARVIFLORA PAVONIA-HASTATA SIDA-RH 249 1970
MALVA-ROTUNDIFOLIA HIBISCUS-SABDARIFFA S 076 1971
MALVA-ROTUNDIFOLIA RUMEX-CRISPUS SISYMBR 164 1972
MALVA-SP, POLYGONUM-AVICULARE SINAPIS-AR 219 1968
MALVA-SPP, ALTHAEA-SPP, HIBISCUS-TRIONUM 092 1977
MALVA-SPP, MELANDRIUM-ALBUM RANUNCULUS-F 128 1965
MALVACEAE ALTHAEA-TAURINENSIS ALTHAEA-RU 048 1969
MALVACEAE GRAMINEAE COMPOSITAE ABELMOSCH 237 1971
MALVACEAE HIBISCUS-CANNABINUS COTTON GUS 076 1971
MALVACEAE HIBISCUS-SPP, ABUTILON-SPP, WA 227 1977
MALVACEAE KERRIE-JAPONICA ROSACEAE* EL- 200 1970
MALVACEOUS STERCULIACEOUS ABUTILON-OXYCA 249 1970
MALVASTRUM-COROMANDELIANUM MALVASTRUM-S 249 1970
MALVASTRUM-SPICATUM MELANTHERA-HASTATA H 159 1966
MALVASTRUM-SPICATUM SIDA-CORDIFOLIA SIDA 249 1970
MAMESTRA-THALASSINA WEEDS BLACK-CURRANT 198 1976
MAMMEN, VASUDEVAN-NAIR, RICE BALIOTHRIPS 176 1977
MAMONTOVA-SOLUKHA, HAPANOVA, PEMPHIGUS-F 178 1966
MAMONTOVA, PEMPHIGUS-FUSCICORNIS SUGARBE 177 1975
MANAZES, SUGARCANE CERCOPIDS GRAMINACEAE 270 1970
MANGLITZ, GURZ, STEVENS, WALSHIA-MISCECO 179 1971
MANGO GRAPEVINE CONYZA-AMBIGUA* PUTTARU 215 1976
MANI, STALDER, AMETASTEGIA-GLABRATA ORCH 180 1968
MANIHOT-ESCULENTA HELIANTHUS-ANNUUS* TA 267 1968
MANLEY, APHANISTICUS-PENINSULA RICE IMPE 181 1977
MANSUR, MIOGRYLLUS-CONVOLUTUS VINEYARDS 169 1971
MARASMIA-TRAPEZALIS BRACHIARIA-MUTICA* 208 1975
MAREZAK, TETRANYCHUS-URTICAE VEGETABLES 068 1972
MARKKULA, ROUKKA, RHOPALOSIPHUM-PADI MAC 182 1972
MARQUES, MENDONCA-FILHO, AENEOLAMIA-SELE 119 1969
MARTIN, LINGREN, GREENE, TRICOPLUSIA-NI 183 1976
MARTIN, PAIR, SICYOS-ANGULATA HELIOTHIS- 165 1976
MARUCA-TESTULALIS COWPEAS WILD-LEGUMINOU 269 1967
MATHENGE, PHYTOMETRA-ORICHALCEA COFFEE D 027 1974
MATRICARIA-DISCOIDEA SENECIO-VULGARIS* 242 1975
MATRICARIA-MATRICARIOIDES CAPSELLA-BURSA 032 1969
MAURIKIS, ARGYRIOU, SPODOPTERA-LITTORALI 278 1970
MCDONALD, PLAUTIA-AFFINIA SALVIA-SPENDEN 184 1971
MEADOWS PASTURES FIELD-CROPS WEEDS* HOM 130 1978
MECCI, LAPHYGMA-EXIGUA SPODOPTERA-(LAPHY 197 1969
MEDICAGO-CILIARIS CARDUUS-SPP, CHRYSOCOM 148 1972
MEDICAGO-FALCATA MEDICAGO-ROMANICA MEDIC 046 1976
MEDICAGO-HISPIDA LEPIDIUM-STATIVUM SISYM 001 1972
MEDICAGO-HISPIDA HELIANTHUS-ANNUUS PASSI 113 1970

MEDICAGO-LUPULINA TRIFOLIUM-REPENS TRIFO 046 1976
MEDICAGO-LUPULINA LATHYRUS-VENOSUS GLYCY 173 1977
MEDICAGO-ROMANICA M DICAGO-LUPULINA TRIF 046 1976
MEDICAGO-SATIVA MEDICAGO-FALCATA MEDICAG 046 1976
MEDICAGO-SATIVA FLAX TARAXACUM-OFFICINAL 136 1969
MEDICAGO-SATIVA* MACFARLANE. THORSTEINS 173 1977
MEDICAGO-SATIVA* RAO THIRUMALACHAR. STO 223 1977
MEDICAGO-SATIVA MELILOTUS-ALBA TRIGONELL 244 1973
MEDICAGO-SATIVA GAURA-VILLOSA GAURA-BRAC 247 1969
MEDICAGO-SP. MELILOTUS-SP. TRIFOLIUM-CAM 222 1969
MEIGENIA-MUTABILIS* BROVDII. GONIOCTENA 046 1976
MEIKLEIRE. OULEMA-(LEMA)-MELANOPA OULEMA 187 1971
MEIKLEIRE. WILD-PLANTS PEAR APPLE ORCHAR 185 1968
MELANDRIUM-ALBUM RANUNCULUS-FICERIA RANU 128 1965
MELANDRIUM-ALBUM POTATO ARMORACIA-LAPATH 196 1970
MELANITIS-LEDA RESERVOIR* MANLEY. APHAN 181 1977
MELANOPLUS-BIVITTATUS MELANOPLUS-FEMURRU 022 1976
MELANOPLUS-BIVITTATUS FABA-BEANS WEEDS V 173 1977
MELANOPLUS-FEMURRUBRUM CICHORIUM-SP. TRI 022 1976
MELANTHERA-HASTATA HELIOTHIS-ZEA COTTON* 159 1966
MELEKGHASSEMI. PEGOMYA-BETAE BEET SPINAC 175 1969
MELIGETHES-AENEUS PHYLLOTRETA-UNDULATA P 160 1975
MELILOTUS-ALBA MELILOTUS-HIRSUTA MELILOT 179 1971
MELILOTUS-ALBA TRIGONELLA-FOENUM-GRAECUM 244 1973
MELILOTUS-ALBA-VAR.-UBAN PANICUM-MILIACE 237 1971
MELILOTUS-HIRSUTA MELILOTUS-OFFICINALIS 179 1971
MELILOTUS-INDICA CHENOPODIUM-MURALE PLAN 001 1972
MELILOTUS-INDICA WITHANIA-SOMNIFERA SOLA 061 1972
MELILOTUS-OFFICINALIS MELILOTUS-POLONICA 179 1971
MELILOTUS-POLONICA MELILOTUS-SUAVEOLENS 179 1971
MELILOTUS-SP. TRIFOLIUM-CAMPESTRE TRIFOL 222 1969
MELILOTUS-SP.* JACOBSON. EUXOA-TRISTICU 136 1969
MELILOTUS-SPP. RED-CLOVER TRIFOLIUM-PRAT 179 1971
MELILOTUS-SUAVEOLENS MELILOTUS-TAURICA M 179 1971
MELILOTUS-TAURICA MELILOTUS-WOLGICA LUPI 179 1971
MELILOTUS-WOLGICA LUPINUS-SP. ASTRAGALUS 179 1971
MELITTIA-CUCURBITAE CUCURBITA-MAXIMA SQU 131 1973
MELON WEED* MINORANSKII. FORFICULA-TOMI 190 1968
MENDONCA-FILHO. AENEOLAMIA-SELECTA SUGAR 119 1969
MERCADO. SPODOPTERA-FRUGIPERDA SPODOPTER 066 1968
MERIDIONALIS ALMOND ROSACEAE* BOURNIER. 042 1970
MERLEIRE. AGROTIS-SEGETUM SCOTIA-SEGETUM 186 1977
MEROMYZA-NIGRIVENTRIS CEREALS GRASSES ME 094 1969
MEROMYZA-SALTATRIX POA-SPP. AGROPYRON-RE 094 1969
METCALFE. SACCHAROSYDNE-SACCHARIVORA SUG 188 1968
METOPOLOPHIUM-DIRHODUM OATS WHEAT RYE MY 274 1976
MICCOTROGUS-PICIROSTRIS HYPERA-SP. SITON 209 1971
MIKHAILOVA. TRIGONOTYLUS-RUFICORNIS WHEA 189 1970
MILLET AGROPYRON BROMUS CYNODON SETARIA* 158 1973
MILLET BELL-PEPPERS BUSH-BEANS* MARTIN. 183 1976
MILLET RICE AGROPYRON-REPENS* NARCHUK. 199 1968
MILLET WILD-GRASSES ATHERIGONA-SOCCATA S 226 1977
MILLETTIA-THONNINGII CACAO* ANONYMOUS. 012 1969
MINORANSKII. FORFICULA-TOMIS POTATO SUNF 190 1968
MIOGRYLLUS-CONVOLUTUS VINEYARDS WILD-PLA 169 1971
MIRABITIS-JALAPA SONCHUS-ARVENSIS SPILAN 035 1972

MITCHELL. PHTHORIMAEA-OPERCULELLA POTATO 191 1969
MITIC-MUZINA. BYRSOCRIPTA-GALLARUM ANOEC 192 1969
MNESETHIA-LAEVIS WILD-GRASSES* PRAKASA- 211 1977
MOCIS-LATIPES SUGARCANE GRAMINACEAE SORG 065 1973
MOFFITT. TURNER. EUXOA-OCHROGASTER ASPAR 266 1975
MOIZ. NAGVI. ATHERIGONA-VARIA-VAR.-SOCCA 193 1969
MOMORDIAC-CHARANTIA CHRYSANTHEMUM-SPP. T 258 1976
MONARDA-CITRIODORA TIDESTROMIA-LANUGINOS 247 1969
MONARDA-PUNCTATA-VAR.-CORYII OENOTHERA-L 247 1969
MOONG WHEAT KNOL-KOHL CONVOLVULUS-ARVENS 030 1969
MOORE. MUELLER. SPISSISTILUS-FESTINUS SO 194 1976
MORACEAE EUPHORBIACEAE* DANTHANARAYANA. 069 1968
MOREHEAD. DAVIS. JOOS. BEARDEN. BERLOWIT 029 1976
MORGAN. ABU. RICE DIOPSIS-ICHNEUMONEA DI 195 1973
MUELLER. SPISSISTILUS-FESTINUS SOYBEAN X 194 1976
MUKHARJI. LEPTOCORISA-ACUTA RICE BLUMEA- 161 1975
MUKHERJEE. WILD-PLANTS HOSTS TETRANYCHUS 061 1972
MULLER. AULACORTHUM-SOLANI FILIPENDULA-U 196 1970
MUNSHI. MECCI. LAPHYGMA-EXIGUA SPODOPTER 197 1969
MUNSHI. NEZARA-VIRIDULA POTATO CLEOME-VI 171 1972
MURTHY. DICANTHIUM-ANNULATUM JOWAR OLIGO 149 1956
MUSICH. BERRY-CROPS GRAPHIPHORA-AUGUR IR 198 1976
MUSTARD* FEENY. PAAVWE. DEMONG. PHYLLOT 095 1970
MUSTATEA. BOTHYNODERES-PUNCTIVENTRIS SUG 063 1977
MYOSOTIS-PALUSTRIS DIGITALIS-PURPUREA GE 196 1970
MYTHIMNA-(CIRPHIS)-UNIPUNCTA CEREALS RIC 026 1972
MYTHIMNA-(CIRPHIS)-LAREYI RICE ERIOCAULO 104 1972
MYTHIMNA-(PSEUDALETIA)-SEPARATA MYTHIMNA 104 1972
MYTHIMNA-UNIPUNCTA MAIZE OATS CEREALS WI 036 1970
MYZUS-ASCALONICUS-AULACORTHUM-SOLANI APH 128 1965
MYZUS-CEREASI CHERRY GALIUM-SCHULTESII V 282 1966
MYZUS-PERSICAE MACROSIPHUM-EUPHORBIAE RH 009 1969
MYZUS-PERSICAE MYZUS-ASCALONICUS AULACOR 128 1965
MYZUS-PERSICAE APHIS-FABAE AULACORTHUM-S 138 1971
MYZUS-PERSICAE BEMISIA-TABACI TETRANYCHU 255 1967
MYZUS-PERSICAE PEACH CHENOPODIUM-ALBUM A 265 1975
MYZUS-PERSICAE MACROSIPHUM-EUPHORBIAE AU 274 1976
MYZUS-PERSICAE* WALLIS. TURNER. WEEDS S 285 1969
NAGUIB. SPODOPTERA-LITTORALIS CLOVER ERA 001 1972
NAGVI. ATHERIGONA-VARIA-VAR.-SOCCATA SOR 193 1969
NAMA-HISPIDUM MEDICAGO-SATIVA GAURA-VILL 247 1969
NAPIERGRASS MAIZE* BATRA. VEGETABLES CE 030 1969
NAPOMYZA CHICORY CARROTS CAMOMILE NAPOMY 242 1975
NAPOMYZA-CARUTAE CARAWAY CARUM-CARVI NAP 242 1975
NAPOMYZA-CICHORII CICHORIUM-SP. LETTUCE 242 1975
NAPOMYZA-LATERALIS MATRICARIA-DISCOIDEA 242 1975
NARCHUK. DIPTERA CEREAL GRASSES WHEAT BA 199 1968
NARDUS-STRICTA DESCHAMPSIA-CAESPITOSA HO 047 1967
NASONOVIA-RIBISNIGRI WILD-COMPOSITE RHOP 274 1976
NASSIF. SPODOPTERA-LITTORALIS HIBISCUS-C 200 1970
NECTARINES TAENIOTHRIPS-VULGATISSIMUS ME 042 1970
NEOMYZUS-CIRCUMFLEXUS APHIS-GOSSYPII POT 274 1976
NEPHOTETTIX-CINCTICEPS NEPHOTETTIX-NIGRO 056 1969
NEPHOTETTIX-CINCTICEPS ALOPECURUS-AEQUAL 059 1976
NEPHOTETTIX-MALAYANUS TUNGRO-DISEASE* H 129 1977
NEPHOTETTIX-NIGROPICTUS APICALIS* CHEN. 056 1969

NEPHOTETTIX-NIGROPICTUS NEPHOTETTIX-VIRE	129	1977
NEPHOTETTIX-PARVUS NEPHOTETTIX-MALAYANUS	129	1977
NEPHOTETTIX-VIRESCENS RICE WEEDS NEPHOTE	129	1977
NETTLE LUPIN* HAMMAD. RAAFAT. VANESSA-(	124	1973
NEZARA-VIRIDULA POTATO CLEOME-VISCOSA PU	171	1972
NICANDRA-PHYSALODES NICOTIANA-AMPLEXICAU	067	1969
NICANDRA-PHYSALOIDES* MITCHELL. PHTHORI	191	1969
NICOTIANA-AMPLEXICAULIS NICOTIANA-DEBNEY	067	1969
NICOTIANA-DEBNEYI NICOTIANA-GLAUCA NICOT	067	1969
NICOTIANA-GLAUCA NICOTIANA-MEGALOSIPHON	067	1969
NICOTIANA-GLUTINOSA NICOTIANA-LANGSDORFF	067	1969
NICOTIANA-GOODSPEEDII NICOTIANA-SUAVEOLE	067	1969
NICOTIANA-LANGSDORFFII NICOTIANA-NUDICAU	067	1969
NICOTIANA-MEGALOSIPHON PHYSALIS-SP. SOLA	067	1969
NICOTIANA-NUDICAULIS NICOTIANA-PANICULAT	067	1969
NICOTIANA-PANICULATA NICOTIANA-RUSTICA N	067	1969
NICOTIANA-REPANDA LUCERNE TOMATO COTTON	113	1970
NICOTIANA-RUSTICA NICOTIANA-RUSTICA-VAR.	067	1969
NICOTIANA-RUSTICA-VAR.-AMARELLA NICOTIAN	067	1969
NICOTIANA-RUSTICA-VAR.-BRASILIA NICOTIAN	067	1969
NICOTIANA-RUSTICA-VAR.-HUMILIS* CUNNING	067	1969
NICOTIANA-SP. RUMEX-SP. SOLANUM-SPP. PAS	126	1976
NICOTIANA-SUAVEOLENS PHYSALIS-PERUVIANA	067	1969
NICOTIANA-SYLVESTRIS FABINA-IMBRICATA HY	067	1969
NICOTIANA-TABACUM SOLANUM-MAURITIANUM SO	067	1969
NIEMCZYK. FLESSEL. HYPERA-VARIABILIS-(HB	201	1970
NIKOLOVA. AGROTIS-IPSILON TOBACCO BEET M	202	1971
NILAPARVATA-LUGENS WEEDS* ANONYMOUS. NI	014	1969
NILAPARVATA-LUGENS LAODELPHAX-STRIATELLA	153	1975
NOGINA. POTATO HOPS HYDRAECIA-MICACEA GR	157	1968
NOMADACRIS-SEPTEMFASCIATA LAWNS CYNODON	071	1968
NUCLEAR-POLYHEDROSIS WEEDS* MACELJSKI.	172	1972
NUMICIA-VIRIDIS SUGARCANE GRASSES SEDGES	052	1967
NUMICIA-VIRIDIS SUGARCANE GRASS* CARNEG	053	1969
NYSIUS-RAPHANUS SISYMBRIUM-IRIO VINEYARD	028	1970
NYSIUS-VINITOR PORTULACA-OLERACEA CITRUS	089	1976
OAKLEY. OSORIO. APHIDS POTATO CAPSICUM M	009	1969
OATS AVENA-FATUA POA-ANNUA* MARKKULA. R	182	1972
OATS BARLEY APPLE GALIUM-APARINE* LOWE.	170	1969
OATS BARLEY GRASSES* BUTANI. CHILO-INFU	050	1969
OATS BARLEY SORGHUM MAIZE GRASSES* MIKH	189	1970
OATS BARLEY URTICA-DIOICA* VARIS. LYGUS	276	1972
OATS CEREALS WILD-GRASSES REEDS ARMYWORM	036	1970
OATS CHAECTONEMA-HORTENSIS PHYLLOTRETA-V	160	1975
OATS GRASSES* DUSEK. CEREAL HYLEMYA-(PH	085	1969
OATS LAWN-GRASSES RYE CORN ERIGERON-SPP.	123	1973
OATS MAIZE MILLET RICE AGROPYRON-REPENS*	199	1968
OATS SORGHUM MILLET AGROPYRON BROMUS CYN	158	1973
OATS WHEAT BARLEY SORGHUM-SUDANENSE SORG	075	1969
OATS WHEAT RYE MYZUS-PERSICAE MACROSIPHU	274	1976
OCIMUM-BASILICUM WEEDS* PRIORE. CERESA-	213	1974
OECANTHUS-PELLUCENS VINES GRAPEVINES GRA	284	1967
OENOTHERA-LACINIATA-VAR.-LACINIATA OENOT	247	1969
OENOTHERA-SERRULATA-VAR.-SERRULATA MONAR	247	1969
OENOTHERA-SPECIOSA-VAR.-CHILDSII OENOTHE	247	1969
OKADA. NEPHOTETTIX-NIGROPICTUS NEPHOTETT	129	1977

OKRA CLOVER CORN SORGHUM MILLET BELL-PEP 183 1976
OKRA HIBISCUS-ESCULENTUS COTTON KAPOK CE 090 1970
OKRA KENAF* LESTON. OXYCARENUS-FIEBERI 167 1970
OKRA VERBENA-SP. SQUASH MEDICAGO-HISPIDA 113 1970
OLIGONYCHUS-(PARATETRANCYCHUS)-INDICUS S 149 1956
OLIGONYCHUS-INDICUS MAIZE SUGARCANE SORG 241 1975
OLIVE CITRUS URTICA* BERBAGALLO. CALOCO 033 1970
OLMI. RICE TETTIGELLA-(CICADELLA)-VIRIDI 203 1968
ONION AGROTIS-SP. LAUNEA-NUDICOLUS* SKV 254 1968
ONION CLOVER TRIFOLIUM-REPENS TOMATO CAP 120 1968
ONION SUNFLOWER HELIANTHUS-ANNUUS THRIPS 220 1974
ONOCOPELTUS-FASCIATUS ASCLEPIAS-SYRIACA 038 1969
ONONIS-SPINOSA PHASEOLUS-VULGARIS TRIFOL 244 1973
OPOMYZA-FLORUM WHEAT WILD-GRASSES CEREAL 015 1969
ORCHARD-GRASS DACTYLIS-GLOMERATA* TAMAK 265 1975
ORCHARDS EUTROMULA-(SIMAETHIS)-PARIANA P 141 1970
ORCHARDS MYZUS-PERSICAE PEACH CHENOPODIU 265 1975
ORCHARDS RUMEX-OBTUSIFOLIUS* MANI. STAL 180 1968
ORCHARDS VINEYARDS MEADOWS PASTURES FIEL 130 1978
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SUGARBEET CASSIDA-NOBILIS CHENOPODIUM IU 045 1968
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SUNFLOWER HELIANTHUS-ANNUUS CABBAGE TOMA 190 1968
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TEA LEGUMINOSAE VERBENACEAE MORACEAE EUP 069 1968
TEA* KAS'YANOV. HOMOROCORYPHUS-NITIDULU 146 1971
TEAK LANTANA EUPATORIUM* DHANARAJAN. EN 074 1976
TENORIO. MANAZES. SUGARCANE CERCOPIDS GR 270 1970
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TETRANYCHUS-TELARIUS TETRANYCHUS-URTICAE 061 1972
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TETRANYCHUS-URTICAE-KOCH AMARANTHUS-VIRI 061 1972
TETRANYCHUS-URTICAE VEGETABLES WEEDS TRE 068 1972
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THIRUMALAI. THRIPS CHIROTHRIPS-MEXICANUS 007 1977
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THLASPI-ARVENSE SINAPIS-ARVENSIS BARBARE 097 1977
THOMAS. APHIS-FRANGULAE-SENSU-LATIORE PO 271 1969
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TKACHEV. LOSHITSKII. APPLE AMETASTEGIA-G 145 1971
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TOBACCO GRAPEVINE WEEDS CORVUS-FRUGILEGU 186 1977
TOBACCO NICANDRA-PHYSALOIDES* MITCHELL. 191 1969
TOBACCO OKRA CLOVER CORN SORGHUM MILLEI 183 1976
TOMATO CAPSICUM-MEXICANUM AMARANTHUS-RET 120 1968
TOMATO CASSAVA MANIHOT-ESCULENTA HELIANT 267 1968
TOMATO COTTON OKRA VERBENA-SP. SQUASH ME 113 1970
TOMATO EGG-PLANT SOLANUM-MELONGENA BEANS 102 1972
TOMATO NICOTIANA-TABACUM SOLANUM-MAURITI 067 1969
TOMATO POTATO BITTERSWEET SOLANUM-DULCAM 039 1970
TOMATO POTATO LYCOPERSICUM-PUBERULUM SOL 275 1970
TOMATO SOLANUM-NIGRUM* DAS. PATNAIK. LE 070 1971
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TOMATOES BROCCOLI BRUSSELS-SPROUTS CABBA 126 1976
TOMATOES CUCUMBER MELON WEED* MINORANSK 190 1968
TOMATOES HELIANTHUS-SPP. HUSK-TOMATO PAS 125 1976
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TRAGIA-SPP. TRIPLOCHITON-NIGERICUM* EGU 087 1973
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TRIBULUS-TERRESTRIS* VARMA. SHARMA. SCH 277 1966
TRICHOBARIS-TRINOTATA* FOOTT. SOLANUM-C 098 1968
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TRICHODESMA-AMPLEXICAULE* JALAMKAR. BOR 140 1975
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TRIFOLIUM-PRATENSE CICER-ARIETINUM* SCH	244	1973
TRIFOLIUM-PRATENSE BUSH-BEAN PHASEOLUS-V	276	1972
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TRIFOLIUM-REPENS TOMATO CAPSICUM-MEXICAN	120	1968
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TRIPSACUM-LAXUM ORYZA-SATIVA TRIPSACUM-D	217	1970
TRISSOLCUS-SPP. BEAUVERIA-BASSIANA ASPER	152	1967
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TRITICUM-AESTIVUM SETARIA-FABERII IPOMOE	214	1977
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TURNIP SPINACH BRINJAL PHASEOLUS-MUNGO-R	030	1969
TURNIP-RAPE RED-CLOVER TRIFOLIUM-PRATENS	276	1972
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UMBELLIFERAE* LEROI. PHILOPHYLLA-HERACL	166	1976
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VERASCHAGINA. MYZUS-CEREASI CHERRY GALIU 282 1966
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WEED-FOOD-PLANTS* ALIMDZHANOV. HELIOTHI 003 1971
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WEEDS ALFALFA MEDICAGO-SATIVA FLAX TARAX 136 1969
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WEEDS VICIA-SPP. MEDICAGO-LUPULINA LATHY 173 1977
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WHEAT BARLEY AGROPYRON-INTERMEDIUM MAIZE 044 1967
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WHEAT BARLEY AVENA-FATUA FLAX EGYPTIAN-C 148 1972
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WHEAT BARLEY OATS SORGHUM MILLET AGROPYR 158 1973
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WHEAT BARLEY RYE OATS MAIZE MILLET RICE 199 1968
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WHEAT BARLEY* IQBAL, AZIZ, SPATHOSTERNU 134 1976
WHEAT CARROT PINE OATS BARLEY URTICA-DIO 276 1972
WHEAT CEREALS CEPHUS-PYGMAEUS TRACHELUS- 057 1976
WHEAT CEREALS WILD-GRASSES* ANDERSON, H 008 1968
WHEAT CITRUS-SP, CONVOLVULUS-ARVENSIS FU 150 1969
WHEAT DOLYCORIS-BACCARUM EURYGASTER-MAUR 105 1977
WHEAT KNOL-KOHL CONVOLVULUS-ARVENSIS CAR 030 1969
WHEAT MAIZE PHASEOLUS WEEDS AVENA-SPP, S 100 1976
WHEAT OATS BARLEY APPLE GALIUM-APARINE* 170 1969
WHEAT OATS BARLEY SORGHUM MAIZE GRASSES* 189 1970
WHEAT OATS LAWN-GRASSES RYE CORN ERIGERO 123 1973
WHEAT PENNISETUM-PURPUREUM* SCHEIBELREI 245 1974
WHEAT POA-BULBOSA* BALEVSKI, KONTEV, PE 023 1969
WHEAT RYE BARLEY OATS GRASSES* DUSEK, C 085 1969
WHEAT RYE MYZUS-PERSICAE MACROSIPHUM-EUP 274 1976
WHEAT RYE WILD-GRASSES* ANONYMOUS, CHLO 013 1976
WHEAT TRITICUM-AESTIVUM RYE SECALE-CEREA 073 1971
WHEAT WEEDS* SVETLICHNYI, LOXOSTEGE-STI 261 1977
WHEAT WILD-GRASSES CEREALS BARLEY* ANON 015 1969
WHEATS* MITIC-MUZINA, BYRSOCRIPTA-GALLA 192 1969
WHITE, APHIS-CRACCIVORA CHENOPODIACEAE R 287 1967
WHITE, BARLEY HYLEMYA-(LEPTOHYLEMYIA)-CO 250 1969
WILD* GALLEGO, AELIA-ROSTRATA AELIA-ACU 101 1975
WILD-AND-CULTIVATED-GRASSES* ANONYMOUS, 016 1970
WILD-CARROT* CELLI, DEPRESSARIA-MARCELL 054 1970
WILD-CLOVER APION-APRICANS APION-TRIFOLI 209 1971
WILD-COMPOSITE RHOPALOSIPHONINUS-STAPHYL 274 1976
WILD-GRASSES ATHERIGONA-SOCCATA SORGHUM 226 1977
WILD-GRASSES CEREALS BARLEY* ANONYMOUS, 015 1969
WILD-GRASSES REEDS ARMYWORM PHRAGMITES-C 036 1970
WILD-GRASSES ZIZANIA-SP.* KLIMANOVA, RI 155 1971
WILD-GRASSES* ANDERSON, HAPLODIPLOSIS-M 008 1968
WILD-GRASSES* ANONYMOUS, CHLOROPS-PUMIL 013 1976
WILD-GRASSES* BERIM, TATARINTSEVA, HOPS 034 1976
WILD-GRASSES* MEIRLEIRE, OULEMA-(LEMA)- 187 1971
WILD-GRASSES* PRAKASA-RAO, ISRAEL, RAO, 211 1977
WILD-LEGUMES CLOVER APION-AESTIMATUM API 222 1969
WILD-LEGUMINOUS-PLANTS* TAYLOR, MARUCA- 269 1967
WILD-MALVACEOUS-PLANTS* ENCARNACION, DY 090 1970
WILD-PERENNIAL-MALVACEOUS-PLANTS* WILSO 288 1972
WILD-PLANTS HOSTS TETRANYCHUS-TELARIUS T 061 1972
WILD-PLANTS ORCHARDS* VERASCHAGINA, MYZ 282 1966
WILD-PLANTS PEAR APPLE ORCHARDS* MEIRLE 185 1968
WILD-PLANTS RUBUS VITIS* VIDANO, OECANT 284 1967
WILD-PLANTS* GAMEEL, BEMISIA-TABACI COT 102 1972
WILD-PLANTS* KIER-BYERLY, SUSA-MOSS, EP 151 1967
WILD-PLANTS* LIEBERMANN, ESPUL, MANSUR, 169 1971
WILD-WHITE-CLOVER TRIFOLIUM-REPENS ALSIK 209 1971

WILLOW SALIX-ALBA ALNUS-NITIDA EGG-PLANT	162	1977
WILSON PECTINOPHORA-GOSSYPIELLA COTTON W	288	1972
WISSADULA-HOLOSERICEA LETTUCE BELL-PEPPE	113	1970
WITHANIA-SOMNIFERA SOLANUM-NIGRUM LANTAN	061	1972
WOLFE. SUGARBEET MACROSIPHUM-SLOANIFOLII	128	1965
WOOD-BAKER. MACROSIPHUM-(SITOBION)-AVENA	289	1972
XANTHIUM-PENNSYLVANICUM TOBACCO OKRA CLO	183	1976
XANTHIUM-PENNSYLVANICUM SIDA-SPINOSA CYP	194	1976
XANTHIUM-STRUMARIUM CONVOLVULUS-ARVENSIS	001	1972
XESTIA-C-NIGRUM GRAPHIPHORA-C-NIGRUM POL	198	1976
XYLEBORUS-FORNICATUS TEA LEGUMINUSAE VER	069	1968
YADAVA. ISRAEL. LEPTOCORISA-VARICORNIS L	143	1969
YADAVA. ISRAEL. CIRPHIS-COMPTA SPODOPTER	144	1971
YONKE. LOPP. AMBROSIA-TRIFIDA CAMPYLENCH	218	1978
YUKSEL. EURYGASTER-INTEGRICEPS CEREAL-CR	290	1968
ZAITSEVA. PEMPHIGUS-FUSCICORNIS CHENOPOD	291	1970
ZAJANCKAVSKAS. SIMAETHIS-PARIANA ORCHARD	141	1970
ZEA-MAYS* KALODE. VARMAD. YADAVA. ISRAE	144	1971
ZHUKOVA. STRUKOVA. PEMPHIGUS-FUSCICORNIS	103	1975
ZIZANIA-AQUATICA* CHO. CHILO-SUPPRESSAL	062	1972
ZIZANIA-SP.* KLIMANOVA. RICE HYDRELLIA-	155	1971
ZONOSEMATA-ELECTA PEPPERS LEPTINOTARSA-D	098	1968
ZULIA-ENTRERIANA PASTURES WILD-AND-CULTI	016	1970

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Ohio' major soil types and climatic conditions are represented at the Research Center's 12 locations.

Research is conducted by 15 departments on more than 7000 acres at Center headquarters in Wooster, eight branches, Pomerene Forest Laboratory, North Appalachian Experimental Watershed, and The Ohio State University.

Center Headquarters, Wooster, Wayne County: 1953 acres

Eastern Ohio Resource Development Center, Caldwell, Noble County: 2053 acres

Jackson Branch, Jackson, Jackson County: 502 acres

Mahoning County Farm, Canfield: 275 acres

Muck Crops Branch, Willard, Huron County: 15 acres

North Appalachian Experimental Watershed, Coshocton, Coshocton County: 1047 acres (Cooperative with Science and Education Administration/Agricultural Research, U. S. Dept. of Agriculture)

Northwestern Branch, Hoytville, Wood County: 247 acres

Pomerene Forest Laboratory, Coshocton County: 227 acres

Southern Branch, Ripley, Brown County: 275 acres

Vegetable Crops Branch, Fremont, Sandusky County: 105 acres

Western Branch, South Charleston, Clark County: 428 acres